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cover story

Learning from the Animals

In this issue of the *Mental Health Digest*, as in past issues, are several digests of articles on animal behavior—a porpoise learning to perform more and more unusual acts, a chimpanzee communicating with human beings in sign language, monkeys, dogs, and love birds becoming depressed when separated from loved ones. True, a chimpanzee is not a human being, a dog is not a cat, a rat is not a bee, and a pigeon is not a porpoise. Yet knowledge gained from observation and research on one species may be generalizable, at least in part, to another species. Or, at a minimum, the behavior of other animals may yield clues and hunches that will lead to a better understanding of the behavior of human beings.

(Picture of Flipper and friend courtesy of the Miami Seaquarium, Rickenbacker Causeway, Miami, Florida.)

mental health digest

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The Creative Porpoise: Training for Novel Behavior

KAREN W. PRYOR, RICHARD HAAG, and JOSEPH O'REILLY

The shaping of novel behavior—behavior that does not occur or perhaps cannot occur in an animal's normal activity—has been a preoccupation of animal trainers. The terrier turning somersaults and the elephant balancing on one foot are produced by techniques of successive approximation, or shaping. Novel behavior that is not apparently produced by shaping or differential reinforcement is occasionally seen. Originality is a fundamental aspect of behavior that is difficult to induce in the laboratory.

At the Makapuu Oceanic Center, the senior author introduced a demonstration of reinforcement of previously unconditioned behavior. The animal was a female rough-toothed porpoise named Malia. Within a few days, Malia began emitting an unprecedented range of behaviors, including aerial flips, gliding with tail out of the water, and "skidding" on the tank floor, many of which were unlike anything seen in any other porpoise. It appeared that the criterion, "only those actions will be reinforced which have not been reinforced previously," was met by Malia with the presentation of complete patterns of gross body movement in which novelty was an intrinsic factor.

To see if the training situation could produce a "creative" animal, we repeated Malia's training with another animal. A porpoise named Hou was chosen. This individual had a large repertoire of shaped responses but its "spontaneous activity" had never been reinforced. Hou was "a docile, timid individual with little initiative."

Two to four sessions were held daily, 5 to 20 minutes each, with rest periods of half an hour. A bell was rung at the beginning and end to serve as a context marker. The appearance of the trainers served as an additional stimulus that opportunity for reinforcement was present. A reinforceable act consisted of any movement that was not part of normal swimming action, and which was sufficiently extended to be reported by two or more observers.

The plan of reinforcing one new response in each session was not fully met. Sometimes a previously reinforced response was chosen for reinforcement to strengthen the response, to increase the general level of responding, or to film a given behavior.

After 32 training sessions, the topography of Hou's aerial behaviors became so complex that, while undoubtedly novel, the behaviors exceeded the powers of the observers to discriminate and describe them. This breakdown in observer reliability was one factor in the termination of the experiment.

In the first session, Hou was admitted into the tank and, when given no commands, breached. Breaching, or jumping into the air and coming down sideways, is a normal action in a porpoise. This response was reinforced, and the animal repeated it four times a minute for 8 minutes. Toward the end of the 9-minute session it porpoised, or leaped smoothly out of the water and in, once or twice.

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It continued to breach in the absence of the trainer during a half-hour break. In the second session, porpoising was reinforced and was repeated several times.

Hou began the third session by porpoising; when this was not reinforced, the animal developed a behavior pattern of porpoising in front of the trainer, entering the water in an inverted position, turning right side up, swimming in a large circle, and returning to porpoise in front of the trainer again. It did this 25 times without interruption. Finally, it stopped and laid its head against the pool edge at the trainer's feet. This behavior, nicknamed "beaching," was reinforced and repeated.

Sessions 5, 6, and 7 followed the same pattern. If the first response was not reinforced, Hou ran through its repertoire of responses: breaching, porpoising, beaching, and swimming upside down.

The trainers decided to shape specific responses to interrupt Hou's repetition of a limited repertoire. Session 8 was devoted to shaping a "tail walk," balancing vertically half out of the water. The tail walk was reinforced in Session 9, and Sessions 10 and 11 were devoted to shaping a "tail wave," lifting the tail from the water.

At the end of Session 10, Hou slapped its tail twice, which was reinforced but not repeated. At the end of Session 12, Hou departed from the stereotyped pattern to the extent of inverting, turning right-side up, and then inverting again while circling.

Hou began Session 13 by swimming in the inverted position, then right-side-up, then inverted again. This behavior, dubbed a "corkscrew," was reinforced, and was extended to five complete revolutions per reinforcement. In Session 14, the experimenters reinforced any descent toward the bottom of the tank, in an effort not only to expand Hou's repertoire but also to interrupt the persistent circling behavior.

The next morning Hou was unusually active in the holding tank; it slapped its tail twice, and this was so unusual that the trainer reinforced the response. When Session 5 began, Hou emitted the response reinforced in the previous session, of swimming near the bottom, and then the response previous to that of the corkscrew, and then fell into the circling and porpoising with the addition of a tail-slap on re-entering the water. This slap was reinforced, and the animal combined slapping with breaching, and then began slapping disassociated from jumping; for the first time it emitted responses in all parts of the tank, rather than right in front of the trainer.

In Session 16 Hou became extremely active when the trainer appeared and offered twisting breaches, landing on its belly and its back. It also began somersaulting on its long axis in mid-air. The trainer began reinforcing the last, a "flip" not normally seen in this genus, and Hou became very active, swimming in figure eights (unprecedented) and leaping repeatedly. The flip occurred 44 times, intermingled with some of the previously reinforced responses and with three other responses that had not been seen before: an upside-down tail-slap, a sideswipe with the tail, and an aerial spin on the short axis of the body. In Session 16, Hou emitted a total of eight behaviors, each one many times, including four completely new, unreinforced be-

haviors, two of which, the spin and the flip, were elaborately performed from the beginning. This session also differed in that once the flip had become established, the other behaviors did not drop out. By Session 16, the experimenters had apparently been successful in establishing a class of responses characterized by the description, "only new kinds of responses will be reinforced," and the porpoise was emitting an extensive variety of new responses.

In Sessions 17 to 27, the new types of responses in Session 16 were selected, one by one, for reinforcement, and some old responses were reinforced again. Other new responses, such as twisting jumps and sinking head downwards, occurred sporadically. The average rate of response and the numbers of types of responses per session remained more than twice is high as pre-Session 16 levels.

Hou's general activity changed in two ways after Session 16. If no reinforcement occurred in several minutes, the rate and level of activity declined but the animal did not necessarily resume a stereotyped behavior pattern. Activity included much behavior typically associated in cetaceans with situations producing frustration or aggressiveness, such as slapping the water with head, tail, pectoral fin, or whole body.

In all final sessions, the criterion that the behavior must be a new one was enforced. Session 28 began with a variety of responses, including one that had been seen but not reinforced before, a sideswipe at water surface with the tail, which was reinforced. In Session 29, Hou's activity included an inverted leap that fulfilled the criterion. In Session 30, Hou offered 60 responses, none of which was new.

In Session 31, Hou entered the tank and, after a preliminary jump, stood on its tail and clapped its jaws at the trainer, who, taken by surprise, failed to reinforce the maneuver. Hou emitted a brief series of leaps and then executed a backwards aerial flip that was reinforced and immediately repeated 14 times without intervening responses of other types. In Session 32, after one porpoise and one flip, Hou executed an upside-down porpoise, and, after it was reinforced, repeated this new response 10 times, again without other responses.

In the third session of the day, Hou did not initially emit a response judged new by the observers. At the end of the 19 minutes, Hou stood on its tail and clapped its jaws, spitting water toward the trainer; this time the action was reinforced, and was repeated five times. Hou had produced a new behavior in six out of seven consecutive sessions.

Hou continues to exhibit a marked increase in general level of activity and has learned to leap tank partitions to gain access to other porpoises, a skill seldom developed by a captive porpoise. Also, when a trainer was occupied at an adjoining porpoise tank Malia jumped from the water, skidded across six feet of wet pavement, and tapped the trainer with its snout, a bizarre act for an aquatic animal.

Individual differences in ability to create unorthodox responses no doubt exist; Malia's novel responses are more spectacular and "imaginative" than Hou's. However, by using the technique of training for novelty, it should be possible to induce a tendency toward spontaneity and creative responses in most individuals of a broad range of species.

Teaching Sign Language to a Chimpanzee

R. Allen Gardner and Beatrice T. Gardner

The extent to which another species might be able to use human language is a classical problem in comparative psychology. One approach is to consider the nature of language, processes of learning, neural mechanisms of learning and of language, and the genetic basis of these mechanisms, and then, while recognizng gaps in what is known about these factors, to attempt to arrive at an answer by dint of careful scholarship. An alternative is to try to teach a form of human language to an animal. We chose the latter and began training an infant female chimpanzee, Washoe, to use the gestural language of the deaf.

It is generally conceded that chimpanzees are highly intelligent. Of equal importance is their sociability and capacity for forming strong attachments to human beings. It seems likely that sociability is essential for the development of language in human beings, and it was a primary consideration in our choice of a chimpanzee as a subject.

But chimpanzees are wild animals, and this is a disadvantage. Chimpanzees are also very strong. Coupled with wildness, this great strength presents difficulties for a procedure that requires interaction with a free-living animal.

A more serious disadvantage is that human speech sounds are unsuitable as a medium of communication for the chimpanzee. The vocal apparatus and the vocal behavior of the chimpanzee are different from those of man.

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Use of the hands, however, is a prominent feature of chimpanzee behavior. Even caged chimpanzees develop begging and similar gestures spontaneously, while individuals that have had extensive contact with human beings have displayed a wide variety of communicative gestures. We chose a language based on gestures because we reasoned that gestures for the chimpanzee should be analogous to bar-pressing for rats, key-pecking for pigeons, and babbling for humans.

Two systems of manual communication are used by the deaf. One is finger spelling, in which configurations of the hand correspond to letters of the alphabet. The other system, sign language, consists of a set of manual configurations and gestures that correspond to particular words or concepts.

We chose the American Sign Language (ASL). The ASL can be compared to pictograph writing in which some symbols are arbitrary and some are representational or iconic, but all are arbitrary to some degree. The fact that ASL is in current use by human beings is an advantage. The early linguistic environment of the deaf children of deaf parents is in some respects similar to the linguistic environment that we could provide for an experimental subject. This should permit some comparative evaluation of Washoe's eventual level of competence.

We reasoned that the dangers of starting too late were greater than the dangers of starting too early, and we sought the youngest infant we could

get. The youngest laboratory infant we could get would be about two years old, so it seemed preferable to obtain a wild-caught infant. Wild-caught infants are usually at least eight to ten months old before they are available for research.

Washoe's exact age will never be known, but from her weight and dentition we estimated it to be between eight and fourteen months when she arrived. Washoe was indeed very young; she did not have her first canines or molars, her hand-eye coordination was rudimentary, she had only begun to crawl about, and she slept a great deal. Apart from making friends with her and adapting her to the daily routine, we could accomplish little during the first few months.

At the outset we were sure that Washoe could learn to make signs to obtain food, drink, and other things. We felt that more must be developed. We wanted to develop behavior that could be described as conversation. With this in mind, we attempted to provide Washoe with an environment that might be conducive to this sort of behavior. Confinement was to be about the same as that of human infants. Her human companions were to be friends and playmates, providers and protectors, and they were to introduce games and activities that would be likely to result in maximum interaction.

All of Washoe's human companions have been required to master ASL and to use it extensively in her presence, in association with interesting activities and events and also in a general way, as one chatters at a human infant in the course of the day.

The environment is not a silent one. The human beings can vocalize, laughing and making sounds of pleasure and displeasure. Whistles and drums are sounded, and hands are clapped for attention. The rule is that all meaningful sounds, whether vocalized or not, must be sounds that a chimpanzee can imitate.

Training Methods

Imitation—The imitativeness of apes is proverbial. Those who have worked closely with chimpanzees have frequently remarked on their readiness to engage in visually guided imitation. Getting Washoe to imitate us was not difficult, for she did so spontaneously, but getting her to imitate on command has been another matter. Not until the 16th month of the project did we achieve any control over Washoe's imitation of gestures. Eventually we got to a point where she would imitate a simple gesture, such as pulling at her ears. Up to now imitation of this sort has not been an important method for introducing new signs into Washoe's vocabulary.

As a method of prompting, we have been able to use imitation to increase the frequency and refine the form of signs. Washoe sometimes fails to use a new sign in an appropriate situation, or uses an incorrect sign. At such times we make the correct sign to Washoe, repeating the performance until she makes the sign herself. Again, with new signs, and often with old signs, Washoe can lapse into poor "diction." Of course, a great deal of slurring and a wide range of variants are permitted in ASL as in any spoken language. Washoe's diction has been improved by the device of repeating, in exaggeratedly correct form, the sign she has just made, until she repeats it herself in more correct form. On the whole, she has responded well to prompting, but there are limits to its

use with a wild animal. Pressed too hard, Washoe can become diverted from her original object; she may ask for something different, run away, go into a tantrum, or bite her tutor.

Chimpanzees also imitate after some delay, and this delayed imitation can be quite elaborate. The following is an example of delayed imitation. From the beginning she was bathed regularly. Also, from her 2nd month, she had dolls to play with. One day, during the 10th month, she bathed a doll in the way we bathed her. She filled her bathtub with water, dunked the doll in the tub, took it out and dried it with a towel. She has repeated the performance many times since.

This is a type of imitation that may be important in the acquisition of language by human children, and many of our procedures with Washoe were devised to capitalize on it. Routine activities—feeding, dressing, bathing, and so on—have been ritualized, with appropriate signs in the rituals. Many games have been invented which can be accompanied by appropriate signs. Objects and activities have been named as often as possible, especially when Washoe seemed to be paying particular attention to them. New objects and new examples, of familiar objects, including pictures, have been brought to her attention, together with the appropriate signs. She likes to ride in automobiles, and a ride in an automobile, including the preparations for a ride, provides a wealth of sights that can be accompanied by signs.

Washoe has been exposed to a wide variety of activities and objects, together with their appropriate signs, in the hope that she would come to associate the signs with their referents and later make the signs herself. We believe that she has come to understand a large vocabulary of signs. This was expected, since a number of chimpanzees have acquired extensive understanding vocabularies of spoken words, and even dogs can acquire a sizable understanding vocabulary of spoken words. The understanding vocabulary that Washoe has acquired, however, consists of signs that a chimpanzee can imitate.

It is difficult to decide which signs were acquired by the method of delayed imitation. The first appearance of these signs is likely to be sudden and unexpected; it is possible that some inadvertent movement of Washoe's has been interpreted as meaingful by one of her companions.

Babbling—We expected a great deal of manual "babbling," but during the early months we observed very little. Is the course of the project, however, there has been a great increase in manual babbling. We have been particularly encouraged by the increase in movements that involve touching parts of the head and body, since these are important components of many signs. Also, more and more frequently, when Washoe has been unable to get something that she wants, she has burst into a flurry of random flourishes and arm-waving.

Related to babbling are gestures that seem to have appeared independently of any training on our part, and that resemble signs so closely that we could incorporate them into Washoe's repertoire with little or no modification. Almost from the first she had a begging gesture—an extension of her open hand, palm up, toward one of us. She made this gesture in situations in which she wanted aid and in situations in which we were holding some

object that she wanted. The ASL signs for "give me" and "come" are very similar to this, except that they involve a prominent beckoning movement. Gradually Washoe came to incorporate a beckoning wrist movement into her use of this sign.

Another sign of this type is the sign for "hurry," which, so far, Washoe has always made by shaking her open hand vigorously at the wrist. This first appeared as an impatient flourish following some request that she had made in signs. The correct ASL for "hurry" is very close, and we began to use it in appropriate contexts. We believe that Washoe has come to use this sign in a meaningful way, because she uses it when she is in a hurry—for example, when rushing to her nursery chair.

Instrumental conditioning—It seems intuitively unreasonable that the acquisition of language by human beings could be strictly a matter of reiterated instrumental conditioning. Nevertheless, the "trick vocabulary" of early childhood is probably acquired in this way, and this may be a critical stage in the acquisition of language by children. A minimal objective of this project was to teach Washoe as many signs as possible by whatever procedures we could enlist. Thus, we have not hesitated to use instrumental conditioning.

Anyone familiar with young chimpanzees knows about their passion for being tickled. When we would pause in our tickling, Washoe would indicate that she wanted more tickling by taking our hands and placing them against her ribs or around her neck. The meaning of these gestures was unmistakable, but since we were not studying our ability to interpret her gestures, we decided to shape an arbitrary response. When being tickled, she tended to bring her arms together to cover the place being tickled. The result was a crude approximation of the ASL sign for "more." At first, any approximation to the "more" sign was rewarded. Later, we required closer approximations and introduced imitative prompting. Soon, a good version of the "more" sign could be obtained, but it was specific to the tickling situation.

In the 6th month we were able to get "more" signs for a new game that consisted of pushing Washoe across the floor in a laundry basket. We used imitative prompting to elicit the "more" sign. Soon after the "more" sign became spontaneous and reliable in the laundry-basket game, it began to appear as a request for more swinging (by the arms)—again, after first being elicited with imitative prompting. From this point on, Washoe transferred the "more" sign to all activities, including feeding.

The sign for "open" had a similar history. When Washoe wanted to get through a door, she tended to hold up both hands and pound on the door. This is the beginning position for the "open" sign. By waiting for her to place her hands on the door and then lift them, and by imitative prompting, we were able to shape a good approximation of the "open" sign, and would reward this by opening the door. Washoe transferred this sign to all doors; then to containers such as the refrigerator, cupboards, drawers, briefcases, boxes, and jars; and eventually to ask us to turn on water faucets.

In the case of "more" and "open" we followed the conventional procedure of waiting for Washoe to make some response that could be shaped

into the sign we wished her to acquire. We soon found that this was not necessary; Washoe could acquire signs that were first elicited by our holding her hands, forming them into the designed configuration, and then putting them through the desired movement.

We have been asked questions such as, "Do you think that Washoe has language?" or "At what point will you be able to say that Washoe has language?" These questions imply a distinction between one class of communicative behavior that can be called language and another class that cannot. This implies a well-established theory that could provide the distinction. If our objectives had required such a theory, we would not have been able to begin this project.

Washoe acquired more than 30 signs and could use them spontaneously and appropriately by the end of the 22nd month of the project. The signs acquired earliest were simple demands. Most of the later signs have been names for objects, which Washoe has used both as demands and as answers to questions. Washoe readily used noun signs to name pictures of objects as well as actual objects and has frequently called the attention of her companions to pictures and objects by naming them. Once acquired, the signs have not remained specific to the original referents but have been transferred spontaneously to a wide class of appropriate referents. At this writing, Washoe's rate of acquisition of new signs is still accelerating.

From the time she had eight or ten signs in her repertoire, Washoe began to use them in strings of two or more. During the period covered by this article we made no deliberate effort to elicit combinations other than by our own habitual use of strings of signs. Some of the combined forms that Washoe has used may have been imitative, but many have been inventions of her own. Only a small proportion of the possible combinations have, in fact, been observed. This is because most of Washoe's combinations include one of a limited group of signs that act as combiners. Among the signs that Washoe has recently acquired are the pronouns "I–me" and "you." When these occur in combinations the result resembles a short sentence. In terms of the eventual level of communication that a chimpanzee might be able to attain, the most promising results have been spontaneous naming, spontaneous transfer to new referents, and spontaneous combinations and recombinations of signs.

At an earlier time we would have been more cautious about suggesting that a chimpanzee might be able to produce extended utterances to communicate information. Washoe's accomplishments will probably be exceeded by another chimpanzee, because it is unlikely that the conditions of training have been optimal in this first attempt. Theories of language that depend upon the identification of aspects of language that are exclusively human must remain tentative until a considerably larger body of intensive research with other species becomes available.

Animal Model of Depression

WILLIAM T. MCKINNEY, JR. and WILLIAM E. BUNNEY, JR.

Depression is a poorly defined entity. It may refer to a symptom, a syndrome, or a nosological entity. Primary symptoms in man consist of a despairing emotional state and depressive mood. Secondary symptoms vary and may include social withdrawal, psychomotor retardation, anorexia, weight loss, and sleep disturbances.

Because of difficulties in evaluating the primary emotional state of animals, "depression" is used here to refer to observable behavioral changes commonly associated with depression in humans, i.e., "secondary" symptoms—changes in responsiveness to the environment, changes in play, decreased motor activity, huddling posture, and sleep disturbance—all progressing to death in some instances.

Need for an Animal Model of Depression

We need a system in which the social and interactional variables thought to be important in depression can be systematically manipulated and their relationship to depression clarified. There is limited opportunity to manipulate these variables in humans.

Similar considerations apply to the relationship of biological variables. For example, theories relating catecholamines and serotonin to depression are based on limited and indirect evidence. This evidence stems largely from the fact that drugs such as the monoamine oxidase inhibitors and tricyclic antidepressants that are effective in human depression are drugs which in some animals elevate the levels of catecholamines or serotonin or both, while drugs such as reserpine or α-methyldopa are thought to induce depression and lower the functional levels of catecholamines or serotonin or both. The production of depression in animals would allow investigation of brain amines and other biological variables.

The most prevalent model of depression is the reserpine model. Reserpine induces severe depression in a small but consistent number of humans treated for hypertension, and these drug-induced depressions have been considered models of the naturally occurring disorders. Also, the effects of reserpine have been studied in experimental animals in in vitro systems. Reserpine in animals produces sedation and accompanying depletion of brain levels of norepinephrine, serotonin, and dopamine. These changes have been postulated to be significant in reserpine-induced depression in man. There is indirect evidence that amine changes may be important in human depression, but the model in which these changes are being studied represents a pharmacologically induced sedation rather than anything resembling human depression.

Evidence for Animal Depression

Current evidence indicating the feasibility of an animal model of depression comes largely from separation experiments in animals and anecdotes about individual animals.

Separation experiments—There are a variety of experiments with rele-

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vance to depression. In experiments with monkeys, mothers and infants were denied physical contact but allowed auditory, visual, and olfactory intercommunication. All mothers and infants showed emotional disturbance, but the infants' disturbances were more intense and enduring than the mothers'. Their initial disturbance was agitation or "protest" and consisted of disoriented scampering around, screeching, and crying. The second phase was increased viewing of the mother, including huddling against the glass separating them, decreased play activity, and decreased infant-infant interaction. When reunited, there was an increase in mother-directed behavior in three of four infants. The fourth phase showed a decrease in mother-directed behavior as compared to the preseparation period. In studies of mother-infant separation at 6 months of age, the mother is transiently, but only transiently, "depressed." The infants, however, show behavioral changes for a longer time, including severe appetite and sleep disturbances.

Many changes following mother-infant separation in monkeys occur in phases similar to those described as part of the separation anxiety seen after human infants are separated from their mothers. They also remind one of the anaclitic depression in infants separated from their mothers during the second half of the first year of life.

There is evidence that "depression" can be induced in the African parrot (Agapornis) ("love birds"). For example, if three African parrots are put in a cage and two form a pair, the one left out develops signs which are obvious to observers in that its plumage becomes rougher and bare, patches appear, and it dies within six months. It seems that being left out in the presence of an observable bond formation can induce severe changes. One love bird left alone does fine if not in the presence of an observable bond.

Case histories—An important step is the collection of case histories of "depressive-like" syndromes in animals and an attempt to sort out any common factors. Such case histories are available in the veterinary and medical literature as well as from veterinarians, keepers of kennels and pounds, zoo keepers, and from primate research centers. It may be important to pay attention to the age and sex of the animal, type of animal, present illness, environmental losses or stresses preceding onset, past history including background, environment, and the clinical course of the syndrome.

Implications for Research

Evaluation of baseline data–In creating an animal model for depression, it is necessary to know the baseline behavior of the species. This should include naturalistic observations in native habitats, as well as in the laboratory, plus genetic and early environmental data.

Induction of depression—If one accepts the importance of separation experiences in producing depression, one issue is that of deciding what is a meaningful separation experience for the animal. A useful contribution would be development of a scale of species-specific experiences; that is, experiences which result in significant emotional or behavioral changes or both when the animal, either in captivity or in the field, is subjected to them.

The question remains as to whether one can produce a syndrome comparable to the depression of adult humans. Would separation experiments utilizing peers rather than the mother and infant produce a depressive-like syndrome? If it were possible to do so with juvenile or adult primates, many developmental and nutritional dependence issues could be circumvented.

The separation of an animal from its human environment may provide another means for studying behavioral reaction to object loss. One possibility is to place dogs in homes for rearing and formation of close attachments and to subject them to separation experiences by removing them from the home at various stages of attachment.

Another kind of model might be based on the importance of dominance in the relationships of many nonhuman primates. Macaques and baboons have hierarchical and social systems in which virtually every interaction between two animals is affected by their status. It is postulated that with changes in the stability of their hierarchical arrangement, behavioral alterations occur. One could try to induce "depression" by experimentally altering the dominance hierarchy relationship.

One could use social isolation or sensory deprivation or both in the laboratory as a method of inducing "depression" in animals. The age at which isolation or deprivation or both is imposed, and the duration of its imposition may be relevant in determining the nature of the response induced. Perhaps at certain developmental stages the reaction would be "depression" rather than fear.

Amygdalectomy has resulted in a marked change in behavior which might be interpreted as "depression." The primates were withdrawn and refused to socialize or eat. They also wandered off and failed to rejoin their colony.

There are no data concerning whether it is possible to breed for animals prone to have depressive disturbances. The use of such animals would facilitate the creation of an animal model of "depression."

It might be useful to use animals with a history of early separation experiences during critical developmental stages. Such animals might be more prone to develop a "depressive" reaction following separation later in life.

Experiments could also be done to determine whether pharmacological treatment of animals with such drugs as reserpine or α-methyl-dopa would sensitize them to later separation experiences.

Evaluation of change—Attempts need to be made to develop behavioral rating scales with specificity for the species being studied. Also, it is necessary to focus specifically on depression when designing animal studies and when analyzing data.

Reversal of "depression"—The creation of an animal model could provide a system in which treatment techniques could be evaluated. This could include the use of social and environmental changes, electroshock, monoamine oxidase inhibitors and tricyclic antidepressants, and precursors of norepinephrine and serotonin.

Minimal Requirement for an Animal Model of "Depression"

The initial emphasis needs to be on the establishment of methodologies for producing a depressed animal. It is important to use animals that form

social bonds because "depression" seems to occur most frequently in those animals that form bonds. The "depression" induced within a social interactional system would then be available for biochemical and behavioral studies.

A model system should meet the following minimum requirements:

The symptoms of the depression should be reasonably analogous to those seen in human depression.

There should be observable behavioral changes which can be objectively evaluated.

Independent observers should agree on objective criteria for drawing conclusions about the subjective state.

The treatment modalities effective in reversing depression in humans should reverse the changes seen in animals.

The system should be reproducible by other investigators.

In addition to the practical and conceptual issues that must be dealt with in creating an animal model of depression, there are some philosophical issues. Studies of animal behavior are often accepted as interesting but of little relevance to the human scene. It is true that devices and methods used in some animal laboratories are often poor analogs to human clinical situations and that clinicians have been unaccepting of animal experimentation in reference to behavioral problems. This limitation needs to be overcome.

The fact that there is often a lack of homology between species does not negate the value of a comparative approach. A comparative approach can identify problems for research and provide a system for investigating and clarifying concepts by allowing them to be tested on an observational and experimental level in animals. Since depression is a problem of enormous magnitude, identification of crucial variables requiring investigation is needed, along with investigation of some currently held concepts. An animal model would provide a beginning. Perhaps we share with higher animals disorders of mood more than disorders involving the higher thought processes, and these mood disturbances might lend themselves to comparative studies.

Response of Neurogenic Amines to Aggregation and Strangers

EUGENE L. BLISS and JANIE AILION

A variety of procedures have been used to induce emotional disturbances in animals. These have included footshock, activation of self-stimulating and aversive centers in the brain, amygdaloid stimulation, and immobilization. Studies have then been done to learn whether changes in "neurogenic amines" occur in the brain under these conditions. Many of these paradigms have been unnatural, although they have been useful as models.

We employed a more naturalistic scheme to induce an emotional disturbance, based on the fact that sudden changes in living space of animals are emotionally and physiologically disruptive. Inbred CBA mice were raised in their family groups, with ample space to meet their territorial needs. Upon reaching adulthood, animals were selected from each litter and placed in a small cage, which involved an abrupt reduction in the territory available, as well as unavoidable, repeated contacts with strangers. They were then studied chemically during the acute phase of their unrest.

Changes in norepinephrine—Female and male mice were first aggregated separately for two hours to determine whether sex might make a difference in chemical responses. In each series there was an identical drop of 11 percent in brain norepinephrine.

Next, regional studies were performed. Decreases in brain norepinephrine after aggregation were large and comparable in all parts of brain, although the greatest decrements were in the hypothalamus.

Animals were then given the tyrosine hydroxylase inhibitor α-methyl-para-tyrosine (75 mg/kg) and were immediately aggregated. This was done to determine whether decreases in absolute levels of norepinephrine in brain with aggregation were due to an increased degradation of this molecule. After α-methyl-para-tyrosine aggregated animals showed a decrement in norepinephrine when compared to controls, suggesting that the absolute decreases represented an augmented catabolism.

Mice were next given a monoamine oxidase inhibitor, pheniprazine (5 mg/kg), just prior to aggregation for two hours. The stressed animals showed an increase in brain norepinephrine, suggesting an augmented rate of synthesis of the amine.

Next, strangers were placed together for two hours, unaggregated, and allowed their normal, accustomed space. Brain norepinephrine decreased by 8 percent, indicating that the proximity of strangers exerted an effect, albeit a smaller one.

Animals were then aggregated for 4, 6 and 12 hours. Values of brain norepinephrine remained depressed at similar levels for the entire period indicating that the neurochemical response to aggregation persisted for at least 12 hours. To determine whether these amine levels would return to normal when this pressure was removed animals were aggregated for

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two hours and then returned to their home cages for two hours. Under these circumstances, values did return to normal.

Studies of norepinephrine levels in spleen, heart, and adrenal were performed with 2 and 6 hours of aggregation. Except for one value, there were no changes indicating that this degree of emotional disturbance produced decreases in norepinephrine only in brain.

Serotonin studies—The stress of aggregation in mice produced no change in the absolute concentration of serotonin in brain. Measurements of 5–HIAA in brain, the principal metabolite of serotonin, did indicate a more rapid turnover of serotonin as well. After 2, 4, 6 and 12 hours of aggregation, 5–HIAA levels were elevated, suggesting that this stress increased the metabolism of serotonin, although, in contrast to norepinephrine, synthesis of serotonin kept pace with degradation.

When unaggregated strangers were placed together for 2 hours, 5–HIAA levels were again elevated, but increases were less than those encountered with aggregation.

Dopamine studies—Two hours of aggregation in mice produced no changes in the absolute levels of dopamine in brain. Aggregated animals given α-methyl-para-tyrosine showed no differences from medicated controls, indicating that this kind of stress did not promote the degradation of dopamine.

These findings in mice are consistent with studies in rats where we found decrements in brain norepinephrine after the behavioral effects of footshock, immobilization, and stimulation via implanted electrodes in the brain.

There appears to be a relationship between the intensity of the behavioral stress and the decrease of norepinephrine in the various organs. In the docile Sprague-Dawley rat, aggregation for 2 hours induces little or no decrease in brain norepinephrine. The CBA mouse, which is a more excitable animal, when aggregated shows an 11 percent decrease in brain norepinephrine but no detectable changes in norepinephrine in the spleen, adrenal, or heart. When the Sprague-Dawley rat is severely stressed by repeated footshocks given every 10 seconds for one hour, it shows not only a 25 percent decrease in brain norepinephrine but even greater decrements of norepinephrine in the spleen, adrenal, and heart. If one can generalize across species, it would appear that moderate stresses may first produce detectable decreases in brain norepinephrine where its half-life is the shortest, while more intense stress will lead to greater decrements in brain norepinephrine, now accompanied by decreases in norepinephrine in the heart, spleen, and adrenal, where the half-life of norepinephrine is longer.

These findings suggest that emotional distrubances involve an activation of the norepinephrine and serotonin systems in brain, which results in a more rapid rate of release of these neuromediators. In the case of norepinephrine, milder activation is first detectable chemically only in brain, but, as more intense responses are elicited, further reductions in brain levels occur, now associated with decreases of nonrepinephrine in peripheral organs. The dopamine system, in contrast, does not appear to be activated by these stresses unless there is much associated muscular work.

Behavioral Individuality in Kibbutz Children

Joseph Marcus, Alexander Thomas, and Stella Chess

The psychological development of children raised in kibbutz settlements has been the focus of interest and attention by behavioral scientists. In many studies the focus has been the search for a specific personality type in kibbutz children, resulting from the special nature of the parent-child relationship and child-rearing practices and has stemmed from theories of child development that give primary importance to early parent-child relationships. But many students of child behavior have become dissatisfied with the attribution of personality development to any one influence. Multiple factors must be taken into account if one is to understand normal development as well as personality disorders.

A basic component of the child's individuality is temperament, which refers to characteristic tempo, rhythmicity, adaptability, energy expenditure, mood and focus of attention, independent of any specific behavior. Temperament is a phenomenological term, with no implications as to genetic, somatologic, endocrine, or environmental etiologies. The term describes the *how* of behavior. It differs from ability, which is concerned with the *what* and *how well* of behavior. It is also distinguished from motivation which seeks to account for *why* a person performs an action.

As with ability and motivation, temperament or behavioral style is not immutable. Its features undergo a developmental course that will be affected by environmental circumstances. The initially identified reactive pattern of the young child may be relatively unchanged by environmental influences, or it may be reinforced and heightened, diminished, or otherwise modified during the developmental course.

Since 1956, two of us (Thomas and Chess) have engaged in studies concerned with the delineation and categorization of behavioral style in early childhood and the influence of these characteristics on normal and deviant psychological development. In all populations studied it has been possible to identify nine categories of temperament:

Activity level—motor component in a child's functioning, and the diurnal proportion of active and inactive periods.

Rhythmicity—predictability of such functions as hunger, feeding pattern, elimination, and sleep-wake cycle.

Approach or withdrawal—nature of the child's response to a new food, object, or person.

Adaptability—speed and ease with which current behavior is able to be modified in response to altered environmental structuring.

Intensity of reaction—energy level of response, irrespective of quality or direction.

Threshold of responsiveness—intensity level of stimulation required to evoke a discernible response to sensory stimuli, environmental objects, and social contacts.

Quality of mood—amount of pleasant, joyful, or friendly behavior as contrasted with unpleasant, unfriendly behavior, or crying.

Distractibility—effectiveness of extraneous environmental stimuli in altering the direction of on-going behavior.

Attention span and persistence—attention span concerns the length of time a particular activity is pursued by the child. Persistence refers to the continuation of an activity in the face of obstacles to the maintenance of the activity direction.

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Given constancy of environmental factors, the outcome will vary with the characteristics of the child upon whom the relatively constant stimulus is brought to bear. This holds true for all aspects of the child's functioning, including the responses to specific child-care practices, parental attitudes, social and learning demands, and the reactions to situations of special stress such as illness, radical changes in family structure, living conditions, or marked shifts in geographic environment. It appears that a child's response to any situation will be determined by the interaction between the child's individual patterns of reactivity and the environment which he both experiences and influences.

It has been with special interest that we turned to children living on a kibbutz where arrangements for care and training of the child are so different from those of children in the previously studied populations. The kibbutz kvutza is one of the most convenient settings in which to observe child development using an interactional model. Here is an easily observable and natural group situation in which the individual temperamental and behavioral patterns come into sharp focus. The varying impacts of parental and other adult behavior may be seen, together with the interaction between the child and his peers. The setting is constant and integrated, with the full range of the child's experiences and responses taking place within it, except for those occasions on which the parents take the child away from the kibbutz for vacation.

By studying a kvutza of six children we obtained descriptions of patterns of feeding, sleeping, and elimination; interactions with peers, parents, metapelet, and other relevant adults; responses to stresses including illness; play activity; preschool learning; task orientation; speech development; and social and intellectual interests. Environmental events or crises affecting the development of individual children or the group have been recorded.

The sample consists of three girls and three boys who grew up together from infancy, and has an age range of six months between the oldest and the youngest child. The group has had a constant metapelet.

When the children were between three-and-one-half and four years of age, the metapelet was interviewed concerning the behavioral development of each child. Follow-up interviews of the children were undertaken shortly after the 1967 Israeli-Arab war, when the children were between five and five-and-a-half years old. These interviews were accompanied by detailed observations of the children, both individually and as a group.

Both the initial and the follow-up interviews with the metapelet yielded sufficient data to make possible the scoring of each child on all nine categories of temperament. Because of the small sample, no attempt was made to determine the distribution of group scores by categories. Inspection of the scores in each category indicates substantial variation in scores. For example, activity level scores varied from 5 for one child to 25 items for another. Intensity of reaction ranged from 18 for two children to 7 items for a third.

The descriptive behavioral data show that individuality and variability characterize the children's personali-

ties and their responses to similar environmental stimuli. It is impossible to universalize the characteristics of the individual children or of the kvutza as a whole. Without longitudinal research tracing the developmental course and intellectual functioning of each child in relationship to his environment, generalizations about the personalities of children brought up on a kibbutz remain impressionistic.

There are, for example, the differing levels of persistence and distractibility: Moshe, who is nonpersistent and distractible, and never completes a project, contrasts with David, Sarah, and Avram who are persistent and nondistractible and who carry through to completion a number of different activities and tasks. This same variability which has been consistent since infancy is evident in the children's play activity and their peer relationships.

David's high activity level leads him into some forbidden activities, such as climbing out of windows and playing in the parking lot, but his energy is usually channeled into constructive play. Rachel, whose conservatism renders her less adaptable to changes in routines or to new experiences, must be given ample latitude to adapt. In contrast to Rachel's unwillingness to accept new experiences. Moshe and David welcome new foods, new routines, new toys, new situations. Of all the children, Avram most easily accepts unfamiliar people.

It is important to note the significance that temperament plays in development of behavioral disturbance. Certain temperamental constellations in a child increase the risk that he will develop psychopathology. One of the children is such a child; analysis of his temperamental pattern reveals him to be highly active, highly distractible, of low persistence and attention span and somewhat negative mood, and this pattern exists since early infancy. This child, unlike the others, has also been subjected to an unusual environmental stress related to the 1967 war. He is the most difficult of the children; the only one unable to play cooperatively with the other children, showing both aggression and destructiveness in peer relations which have increased between the initial interview at three years of age and the follow-up interview at five years. Had this child's patterns gone unrecognized and inappropriate child-care practices been applied, the likelihood of his developing serious deviant behavior would have been increased.

The recognition of temperamental differences and analysis of each child's temperamental patterning is of significant value to parents or child caretakes in assuring the maximum emotional and intellectual development of the child. In kibbutzim where there exist sensitive childcare workers aware of individuality much can be done to prevent the development of behavioral pathology.

DNA Ticketing Theory of Memory

J. S. Griffith and H. R. Mahler

From a biochemical point of view, one of the most puzzling features of long-term memory is its permanence. It does not follow that long-term memories are represented by biochemical alterations, but it is not unlikely that this is the case. Yet almost all cellular constituents are subject to turnover, even beyond the demands of cell division. Nerve cells do not normally divide in adult life and their DNA is generally considered to be metabolically stable, but it is not usually regarded as a plausible candidate for the embodiment of the memory trace.

Yet DNA has an intuitive appeal as the depository of learned information as well as of genetic information. It is the one molecule which, apart from possible minor effects due to genetic damage and repair, is present for the lifetime of the organism.

In order to make a NDA theory of memory worth considering, we must show that it is biochemically reasonable in terms of current knowledge. So we draw attention to the experimentally proven existence of enzymatic processes for modifying the nucleotide sequence of DNA. These involve the methylation of bases (usually cytosine) of which there are many different examples of apparently universal occurrence, although glucosylation has also been observed in the T-even coliphages. Of course, a base which has been modified in this way no longer belongs to the primary set of four, namely G, C, A and T. There may occur certain consequences of the modification at the level of recognition of the DNA by enzymes or of its ability to combine with control elements such as inducers or repressors.

This leads to the suggestion that the physical basis of memory could lie in the enzymatic modification of the DNA of nerve cells. It might be worth looking to see if there are any unusual bases specific to nerve cell DNA, but in the absence of such evidence, a plausible suggestion would be that the modification consists of methylation (or demethylation). We propose that the methylation affects the rate of protein synthesis as, for example, by altering the affinity of an operator region for a repressor molecule, or, preferably, in the manner described later. The DNA may be thought of as a long tape, most of which contains in coded form a representation of the amino-acid sequences of proteins, but with short regions concerned only with control of the transcription or translation of this information. Our DNA model of memory involves the chemical alteration of these control regions.

The Ticketing of *m*RNA

A mechanism for the control of protein synthesis has been suggested as a result of experiments on slime moulds. The idea is that at the 5′-end of an *m*RNA there are a number of repeating groups of nucleotides which are not coding for amino-acids but only serving a control function. Each of these groups is called a ticket. In the simplest version, each time a ribosome passes along the messenger it chops off one ticket. When all tickets

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have been removed, either the ribosomal subunits no longer attach or else the messenger is degraded. Thus the number of protein molecules synthesized per messenger is equal to the number of tickets on the messenger. The tickets, like the rest of the messenger, will have been transcribed from DNA tickets (more strictly anti-tickets). Thus the number of protein molecules to be synthesized during the lifetime of the messenger is specified in the DNA as the number of tickets adjacent to the initiator of the appropriate cistron.

Perhaps the simplest biochemical theory of memory is to suppose that every time a nerve cell fires, the restoration of the membrane potential is coupled biochemically with the synthesis of a fixed quantity of some compound X. Assuming there is no X in the cell at the beginning, that X is never synthesized at any other time, and that X is metabolically stable, then the amount of X in a cell gives a direct measure of the number of times that the cell has fired in its lifetime. The ticketing hypothesis provides an intriguing way in which it could occur. Suppose that an extra ticket were added to the DNA each time the cell fired, starting at first with no tickets. Then the total number of tickets would be equal to the total number of times the cell had fired, and the number of protein molecules produced for each corresponding *m*RNA molecule would equal this number.

The proposal involves the synthesis of new DNA and is therefore not very acceptable as it stands. However, we do not need to excise or add nucleotides in order to alter the control over *m*RNA synthesis. We have merely to suppose that a given cistron which is concerned in the memory mechanism has a fixed, genetically determined number, p say, of tickets adjacent to it. Call a ticket T and a methylated ticket T_m. Then suppose that the ticket T is transcribed, but T_m is not. We may say that the ticket is "masked" when it is methylated. Suppose that at the beginning of life all the tickets get methylated so that we have the arrangement: T_mT_m - - - - T_mT_mC where C is the cistron. We may abbreviate this to $T_m{}^pC$. Now suppose that each time the cell fires one T_m gets unmasked (that is, demethylated), starting from the right-hand end. We then get successively $T_m{}^{p-1}TC$, $T_m{}^{p-2}T^2C$, - - -, $T_m{}^{p-x}T^xC$ Thus after x firings, each *m*RNA molecule gets issued with x tickets and therefore produces x protein molecules before it is degraded. Obviously the system is saturated when $x=p$.

Synaptic Modification

If we suppose that each time two cells which are synapsed together also fire simultaneously, that the synapse is altered in strength, it is important to know how often this simultaneous firing occurs. Approaching this problem in the simplest way, we might argue that if one cell fires on the average α times per second and the other cell β times per second and if we call firing "simultaneous" if they are within t seconds of each other, the expected number of simultaneous firings per second is $2\alpha\beta t (=\alpha.2\beta t)$. If the strength of the synapse were altered always in the one direction, it would have to be altered by a very small amount each time, and if this were achieved through ticketing, an improbably

large number of tickets would be needed.

There are at least two ways around this difficulty. One is that the cells involved in memory may have relatively high threshold so that α and β are much smaller. The other is that there may be a spontaneous tendency of the synapse to revert back to some standard strength. If the strength is proportional to the number of tickets on a particular cistron, this number might execute a random walk (up on each joint firing; down on each spontaneous alteration). The spontaneous movements would represent a form of forgetting.

The idea has been put forward that the primary process initiating the laying down of long-term memory may be the injection of material from one cell to another, across a synapse between them, following their joint firing. Introducing this into the present theory, we would suppose the transported material to be an enzyme (or cofactor) responsible for modifying, that is, demethylating or methylating, a ticket. The enzyme system needs to recognize the configuration T_mT and perhaps T_mC (or TT_m and TC) and demethylate T_m (or methylate T), but to ignore the configurations T_mT_m and TT. The transported material would be ultimately degraded and might last only long enough, on each occasion, to demethylate or methylate one ticket.

One realization of this model would be if the postsynaptic cell could maintain on its soma and dendritic processes a number of terminal boutons from the presynaptic cell proportional to the concentration of a critical protein produced by its own ticketed messenger. The number of boutons generated might even be equal to the number of tickets. Then after each joint firing, a new bouton would appear in the fullness of time.

Experimental Tests

One difficulty in the search for the physical basis of memory is the small amount of chemical modification per cell, or per synapse, which may occur during a learning experiment. In the present model, we cannot be sure that there need be more than a few hundred transmethylations of bases per second throughout the whole brain in order to obtain sufficient information storage per second. This may be a gross underestimate, but it illustrates the possible magnitude of the problem. Nevertheless, there are definite lines of attack on testing the model. Methylation requires s-adenosyl methionine to provide the methyl group and therefore lack of the essential amino-acid methionine would be expected to be associated with disturbances of memory. The number of tickets per cistron might be in the hundreds and consequently the methylated bases would tend to be clumped together in this way. Finally, one might expect a systematic alteration with age in the number of methylated bases, probably showing a dependence on the degree of stimulation or severity of learning programs to which the animal has been subjected.

Demonstrations that methylation appears to be the determinant in the specific destruction of foreign DNA, that ribosomes contain an endonuclease which might qualify as the ticket-removing enzyme, and that neuronal DNA does appear to be capable of some form of limited turnover, all suggest that the model warrants further exploration.

The Perky Effect Revisited: Blocking of Visual Signals by Imagery

SYDNEY JOELSON SEGAL and PEARL-ELLEN GORDON

The "Perky effect" has been a curiosity since it was demonstrated by Titchener's student in 1910. Perky directed observers to form a mental picture of an object, e.g., a tomato, and simultaneously presented a dim red circle to them. She concluded that imagery and stimuli are indistinguishable on the basis of two findings: the subjects did not report a perception and the image described resembled the unreported stimulus.

The two effects may be restated as (*a*) the image may mask perception of an ordinarily supraliminal stimulus, and (*b*) the image may pick up aspects of the unreported stimulus. The purpose of our experiments was to measure these effects, to discover possible artifacts or limitations, and to determine the extent of their generality.

Experiment I

Twelve men and 12 women participated. They were told they would be asked to form and describe mental imagery, as experienced when trying to remember a person or place. The subject was seated and a cylindrical translucent hood was lowered over his head to provide a virtual Ganzfeld before his gaze and a screen through which colored slides could be transmitted.

Two conditions were run: a naive condition, an approximate replication of the Perky equipment, and an informed condition. In the naive condition, the experimenter named six common objects, one by one, and asked the subject to describe his mental image of each. Slides were projected onto the hood as the subject described his mental image of four items. In color and forms, the slide was sometimes congruent with the object, sometime not. After all images were described, the experimenter indicated that slides were sometimes projected, and the subject reported for each image whether or not he thought there had been an accompanying projection. The informed condition followed. Subjects were told slides might again be projected during imaging. Again, six images were elicited, four accompanied by slides. Subjects were instructed to attend to their imagery, but after each image, they were asked whether a slide had been present.

After conclusion of the experimental procedure, subjects were asked to discriminate the slides; 11 recognized all the slides, 18 detected the slides but failed to identify some shapes and colors, and seven detected five or six of the eight slides. There was significantly greater accuracy in the informed than the naive condition.

Experiment II

All subjects were informed that signals might be present. The "informed" task of Experiment I, with the experimenter projecting signals as the subject described his imagery, was compared to two new conditions. One introduced a motor factor to alert the observer toward the stimulus—the

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subject projected the slides himself. The other was a control condition—a simple discrimination task without any imagery.

The procedure was similar, and the same slides were used, but the hood was cone-shaped, with a small screen at the apex.

Twelve male and 12 female undergraduates served as subjects. All subjects had both the experimental-projection and the self-projection tasks, with order systematically varied, and the discrimination condition last.

The informed task was similar to the previous experiment. Fifteen images of common objects were requested, nine accompanied by colored slides, six by blanks. The subjects were told to pay attention to their images, but after each image they were asked whether they thought a slide was projected.

The self-projection task was similar, except that the subject had a remote control unit, and was instructed to press the button to activate the projector as he thought of an image. Of the 15 images, nine were accompanied by a colored slide, six by blank slides.

For discrimination, the subjects were told only to indicate if a stimulus was present or not. This control condition measured the subject's ability to detect the slides in the absence of imaging.

For the first 12 subjects, the slides were projected at the same intensity as in the previous experiment. They were clearly visible to most observers. For the next 12 subjects, intensity was lowered so the slides were barely visible, differing from the surround primarily in their color.

The accuracy scores revealed that the discrimination condition differed significantly from the two imaging tasks. Within the two imaging tasks, there was a significant order effect, but condition was not significant. Signal intensity also was significant.

When the accuracy measures were broken down into the signal detection components, this revealed greater sensitivity in the discrimination task, compared to the imaging procedures. Within the two imaging tasks, the experimental-projection and self-projection did not differ significantly, but the subjects were more sensitive to the second task whichever it was. Bias was more conservative in the imaging tasks than for discrimination, but it was not affected by condition or order. Males appeared far more biased than females; however, their sensitivity scores were similar.

The purpose of these experiments was to demonstrate that the Perky effect is not a fragile phenomenon produced in a student's experiment and never replicated successfully. With reduction of all recognized artifacts and use of the more precise signal detection techniques, it appears that a dim or ambiguous stimulus can be blocked by a concurrent image.

This may appear to be a simple distraction effect, but the data argue otherwise. We hypothesize that imagery may represent a source of internal noise which alters the signal-to-noise ratio. That is, imagery increases the rate of neural activity and is an additional source of noise which must sum with random neural "noise" in the system as well as noise specific to processing of the signal.

The Murderers—Before and After

JORDAN H. LACHMAN and JAMES M. CRAVENS

Of the patients remanded to Bellevue Hospital Psychiatric Male Prison Service during 1965 charged with homicide, we had previously examined 10 of them. The examination was performed at the time of another offense during the preceding five years. This gave an opportunity to compare findings before as well as after the act of homicide. Although the number is not sufficient for statistical analysis, gross features do loom sufficiently large for cautious generalization.

Most of the patients were young. Nine had spent over a year in prison. Two had spent nearly half their lives in institutions. These two had been in the community, in fact, only a brief time (about six weeks) prior to the homicide. At least half had exhibited major behavioral problems before age 10, diagnosed as childhood schizophrenia in four. Only one grew up in what might be considered "middle class" surroundings.

Although it has been observed that the victim of a mentally ill murderer is frequently a close relative, this is not true here—especially if we exclude two atypical cases. In Case 7 the patient killed his baby when he hurled a pumpkin at his wife from a fourth-story window. Although technically a murder, it would appear to be more within the realm of manslaughter, misadventure, or accident. In Case 3 the patient killed his brother while shooting at a stranger in a brawl. Although underlying sibling rivalry cannot be ruled out, poor marksmanship would seem to be a more important factor. This scarcity of relatives among the victims seems to reflect the transient living situations of the patients. Only four lived with family members or common-law wives.

In seven of the ten homicides, weapons were used—knives being the favorite. One murder arose over the possession of a pistol. Despite the fact that over half the patients were involved in criminal pursuits, only one murder occurred "on the job." In almost every case there was everyday acquaintance with knives and pistols These items were normally at hand, and the patients were not only skilled in their use but accustomed to using them as the response to stress.

In nine of the ten cases the crime was associated with the intemperate use of alcohol. Only one of the nine could be considered a "chronic alcoholic." Four were also under the influence of drugs at the time of the homicide.

Despite the fact that several patients had been hospitalized because of "mental illness," they fitted poorly into the diagnostic framework currently in use. Classical pictures of sociopathy and schizophrenia were absent. Although labelled psychopaths, they hardly conformed to the glib, affable, superficially acquiescent, ingratiating type of individual. This is not to assume that these patients approached the "criminal normal" or that their pathology was so subtle as to demand exhaustive methods of evaluation. It is simply that those features with which the psychiatrist is equipped by training and experience

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to evaluate were not prominent or, if encountered, of short duration. The absence of such features was in sharp contrast to the potential danger of violence these individuals posed to the community.

Mental status examination disclosed several characteristics in common. Less than average verbal productivity was associated with shallowness or flattening of affect. The latter was a feature showing little tendency to change even after months of hospitalization. Although two patients had been recommended for hospitalization prior to homicide, disorganization of thought processes or bizarre paranoid delusions were not present. Another common feature was the callousness displayed in response to topics of violence. This was evident not only in discussing the immediate offense, but also during interviews in which the violence of others was discussed.

The abnormality of this group was in some measure reflected in their social adjustment. They resided in a social constellation that generally ranged from the aberrant to the chaotic. In only one of the ten was there anything approaching a stable family setting at the time of the homicide (the case in which the patient inadvertently killed his child).

There was little change in diagnosis between the pre-homicide and post-homicide examinations of these men. Although it might be dramatic to discover an undetected psychotic or schizophrenic process, the problem appears to be different. And that is the lack of disposition available for an unstable, assaultive, frequently criminal youth poorly equipped personally or through family or available social agency to adjust within the community.

Incarceration geared to punishment, rather than to assistance in adjusting to society, seems to have resulted in the release of the patient into the community at the height of his violent and aggressive potential. In addition to absence of effective emotional support from family or friends, the episodic use of alcohol and drugs appears to have further tipped the scales in the direction of violence.

Several remedial measures are suggested. They include:

Accurate appraisal based on several psychiatric interviews and a social service investigation. This investigation should be a broad one, including not only the patient but the setting in which he must adjust.

Sufficient supervision and guidance that realistically deals with the needs of such maladaptive personalities in the community.

Availability of nonpunitive institutions and flexible discharge and readmission policies to meet the needs of patients unable to cope with adjustment in the community.

These are stop-gap measures. An unstable individual brought up in an environment in which violent behavior is the most typical response to stress, with weapons at his disposal, is more likely to commit homicide than an unstable individual unfamiliar with weapons, reared in a more restrained environment. Since we cannot incarcerate or hope to "cure" every unstable person likely to explode aggressively, it would be a more practical course to work toward changing the environment that offers violence as a way of life.

The Obstinate Checklist

MARIANNE MARSCHAK

One day a friend called and asked if I would participate in a study of an infant's behavior during the first three months of life. The purpose was to compare behavioral and biochemical changes.

We set up a scheme whereby I was to observe emotional and intellectual expressions of the infant. We planned to study motor development and the child's adaptation to his environment. In particular, we wanted to observe the child's responsiveness to sensory stimuli and reactions to stress or frustration. Our emphasis was on natural occurrences without experimental interference. I was to design a checklist on which I would enter these occurrences, or dictate my impressions.

I spent hours in the nursery of a maternity ward. I went from crib to crib trying to recognize repetitive bits of behavior in the thrashing of limbs and on faces motionless or distorted by crying. Before I set up the first checklist, I searched for signs of the behavior we listed and realized that if one word matched a movement or expression, other movements or expressions seemed to occur at the same time.

How was I to make sense out of these movements "so different from our own"? The first checklist was headed by the words "time," "date," and "situation." These words were followed by notations on the baby's state and substate. If the baby was in "awake," was he "drowsy, inactive" or "alert, active." If the state was "crying," was he "whimpering," "staccato," "early" or "persistently" crying? What did the infant move? Head? Mouth? Forehead? Left or right hand? If he was not moving, what were the positions of head, arms, and legs? Were the eyes open, half-open, or closed? If closed, were they loosely, medium, or completely closed? Was there a yawn, cough, sneeze, sigh, hiccup, or smile? The check marks were followed by my estimate of his "general activity" and "tenseness."

When I first used the checklist, the baby was crying, limbs thrashing, face screwed up, and forehead wrinkled. I was not able to enter each of these occurrences, nor could I determine reliably the degree of the baby's activity or tension. So I revised one checklist after the other.

Then I noticed that between checklist periods I was susceptible to unlisted occurrences and freely scanned the visual field. Yet, I felt uneasy, as my main allegiance was to the checklist.

During my apprenticeship on the maternity ward, most of the insight I gained by applying free-floating attention was of a trivial and predictable kind. I noticed that most infants were hyperactive before, and sleepy after, nursing, that being carried by the nurse had a quietening effect. Differences between babies were less easy to foresee: in response to the first bath, some infants cried violently while others quietened.

One day I noticed the following behavior which repeated itself: all movements would rather suddenly

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recede; the infant would not fall asleep but would lie in a peaceful state while facial and eye muscles seemed relaxed. This state would last half a minute or less. I watched other babies and found the same suddenness of onset, duration, and type of state. Yet, in the literature I could not find a description of this occurrence, which I called the "quiet period."

On the day the study baby was born, I had completed a new checklist. I also decided on an additional device which, finally, was to accomplish the task. During the three-minutes-off periods, I would dictate a narrative of the ongoing behavior. Thus I would keep a continuous record and still apply, to some degree, free-floating attention.

My observations were made daily during the first two weeks and every second day during the third and fourth weeks. Between the fifth and twelfth weeks, I spaced my visits two days apart. I soon noticed that I had become responsive to the baby's experiences and feelings; to his satiation after nursing and to his anger each time he was lowered into the bath. At the same time, I kept worrying about the usefulness of my method.

When the baby was five weeks old, we tabulated the entries from the checklists. We also computed from my narrative frequencies of such characteristics as "novel behavior." The curves based on the narrative seemed to show meaningful trends, whereas the ones based on checklist entries were mostly erratic.

Yet, more precise data were needed for the final task of comparing biochemical and behavioral observations. After some attempts at charting the checklist curves, I concentrated on the narrative. In order to explain my confidence in the narrative, I have to go back to the attitude which I assumed when narrating the behavior. By observing the baby, sometimes for hours at a time, I had become empathetic to the movements, facial expressions, and sounds of the infant to a degree that my words "mirrored" these behaviors.

From the narrative we extracted such characteristics as "incidents of tremor," "incidents of novel motor behavior," and "responsiveness to persons." We also computed the mother's daily entries; for example, "number of periods of fussiness."

Finally, the material was ready for the computer and the behavioral-biochemical comparison. One finding was particularly striking: between the fifth and seventh weeks some behavioral as well as some biochemical characteristics showed definite, parallel changes. The same period has been mentioned in the literature on infant development as being one of crucial changes.

I have described hazards inherent in observing human behavior for research purposes. My emphasis has been on the perceptive qualities of the observer. I have advocated the attitude of free-floating attention which allows him to make full use of his sensorium and his curiosity. However, I have also pointed out that quantitative procedures are necessary to perform repeatable, statistical manipulations. Observations made by machines may replace checklists entered by observers. A machine which will simulate an observer taking down not the obvious but the subtle and unforeseen aspects of human behavior will have to be infinitely more complex.

Differential Effects of Scopolamine and Chlorpromazine on REM and NREM Sleep in Normal Male Subjects

TERESA SAGALES, SERGIO ERILL, and EDWARD F. DOMINO

The role of biogenic amines, particularly 5-hydroxytryptamine and norepinephrine, in the mechanism of sleep has been the subject of numerous studies. Not as much attention has been paid to the possible participation of cholinergic mechanisms in the two major states of sleep—slow wave EEG (NREM) and rapid-eye movements with EEG fast waves (REM)—or in the transition from one into another. Animal studies suggest that cholinergic mechanisms are involved in sleep. The muscarinic cholinergic antagonist, atropine, has been reported to suppress REM sleep in the cat. Other qualitative differences have been shown in this species depending upon the doses employed. On the other hand, direct injection of oxotremorine or carbachol into the brainstem reticular formation induces REM sleep in the cat.

Scopolamine was considered an appropriate tool to elucidate the role of a cholinergic sleep mechanism in man, since it is often included in over-the-counter sleep-inducing preparations. Clinically, it has been noted that scopolamine induces "dreamless" sleep. This could be due to a decrease in REM or to a decrease in dream recall. Methscopolamine, which has negligible central nervous system effects but even greater peripheral effects, was used to determine the relative importance of central and peripheral cholinergic blocking effects on sleep. The α-adrenergic antagonist, chlorpromazine, also produces sedation and EEG effects similar to those of scopolamine in the waking state. In this study it was used in clinically similar dosage to compare its effects with those of scopolamine.

Eight young healthy men, aged 21 to 29, participated in these experiments. The presence of basal alpha rhythm in the occipital areas during a resting EEG record was required for the acceptance of each subject. The first night of sleep was used for habituation. Recordings were made in a sound-attenuated, temperature-controlled chamber. Electrodes for polygraphic recordings were placed in the usual positions but a continuous all-night recording was not made. The second night was used for the baseline recordings ("no medication" night). After the second night a sequence of saline, methscopolamine Br (0.0055 mg. per kilogram), no medication, scopolamine HBr (0.006 mg. per kilogram), no medication, and chlorpromazine HCl (0.4 mg. per kilogram) injections followed in four of the individuals. In the other four subjects only two drugs (scopolamine and chlorpromazine or scopolamine and methscopolamine) were used. "No medication" nights were intercalated in all instances in order to avoid overlapping in drug effects.

The night when saline was injected was used as control in all cases. Duration and distribution of the sleep stages in the saline night were quite similar to the no medication night.

Effects of scopolamine—The most striking change induced by 0.006 mg.

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per kilogram of scopolamine HBr was a delay in the onset of REM sleep. The onset of stage REM during the saline night took place during the second hour of sleep. In scopolamine-treated individuals there was a complete absence of REM sleep during the first 4½ hours. The mean onset of REM for eight scopolamine-treated subjects occurred 327 minutes after the initiation of recording. Subsequently, bursts of REM were present for the rest of the night. The total amount of REM stage during the 7½ hours of sleep was significantly reduced in comparison with the saline night. Until the end of the recording period, no rebound in REM was seen. The concomitant increase in NREM sleep appeared mostly as an enhancement of stage II. The duration of stage I was also extended. A marked decrease in the total number of rapid eye movements during the night was observed. Inasmuch as rapid eye movements occur during stage REM, the ratio of eye movements to minutes of stage REM was calculated. This analysis showed that the number of eye movements during stage REM was diminished by the administration of scopolamine. This was also observed when a comparison was made between the total number of rapid eye movements and the epochs of REM in which the rapid eye movements appear. The number of body movements per night was increased by scopolamine.

Effects of methscopolamine—In contrast to the changes induced by scopolamine, injection of an equimolar dose of methscopolamine Br did not induce any substantial modification on the pattern of sleep.

Effects of chlorpromazine—Chlorpromazine in a dose of 0.4 mg. per kilogram did not produce any change in the REM/slow wave sleep ratio. No dramatic changes in the sleep cycle were observed with the possible exception of stage III. Chlorpromazine induced an increase of stage III. This increase appeared to be at the expense of stage II sleep.

This study shows that a centrally acting muscarinic cholinergic antagonist, scopolamine, induces marked changes in the pattern of sleep in man. In contrast, chlorpromazine had negligible effects on REM sleep.

Our results stress the importance of cholinergic mechanisms in the physiology of sleep in man. The exact nature of this involvement remains to be elucidated. Further studies are necessary to establish the effects and interactions of drugs with central cholinergic, adrenergic, and serotonergic activity on human sleep.

Our results with chlorpromazine are in accord with those of others using similar doses. There was a lack of correlation between the effects of chlorpromazine and scopolamine upon the sleep patterns, even though their effect on the EEG of awake individuals is relatively similar. Finally, it is interesting that scopolamine, often included in sleep-inducing mixtures, does not produce physiological sleep. The fact that most drugs used as soporifics induce an REM-deprived sleep is well known. Since tolerance to REM depression by barbiturates is well known, it would be of interest to determine if similar tolerance to depression of REM occurs with daily doses of scopolamine given at bedtime.

Dissociation of Sensation and Evoked Responses by a General Anesthetic in Man

DONALD L. CLARK, ROBERT A. BUTLER, and BURTON S. ROSNER

Averaged extracranial sensory evoked responses in conscious man vary with subjective experiences aroused by different stimuli. For example, increased intensity of stimulation produced larger evoked responses and heightened subjective magnitudes of sensation in vision. Such parallels between neuroelectric and psychophysical responses to sensory stimuli suggest that extracranial evoked potentials reflect neurophysiological events underlying perceptual processes. This paper describes a procedure which disrupts correlations between cerebral evoked responses and certain sensory experiences.

Subjects were seven healthy, young male volunteers screened by medical history, physical examination, EKG, and routine laboratory analyses of blood and urine.

The subject arrived at the laboratory in the morning after avoiding ingestion of solids, liquids, or drugs for 12 hours. He was positioned on an operating table, a blood pressure cuff was placed around the left arm, and an intravenous drip was started to permit administration of necessary medications. Disc electrodes to stimulate and record from the right ulnar nerve were taped over the wrist and median epicondyle. A grounded metallic strap smeared with electrode cream was wrapped around the right forearm between peripheral stimulating and recording sites to minimize stimulus artifact. Cerebral potentials were registered from two locations through needle electrodes in the scalp. One was over the left (contralateral) post-Rolandic hand area and the other was on the midline 8 centimeters anterior to the vertex. The reference electrode was a disc taped to the bridge of the nose. Stimuli applied to the wrist were constant-current isolated rectangular pulses 500 microseconds in duration. Stimuli occurred every 4 seconds. After amplification, potentials from the recording electrodes were stored on three FM channels of an instrumentation tape recorder. The overall bandpass of the recording system was .5–1,000 Hz. A trigger signal synchronous with each stimulus was recorded directly on the fourth channel of the tape recorder. Data were processed off-line on a LINC computer. Respiratory P_{CO_2}, EKG, and occipital EEG were monitored and recorded continuously on a polygraph during administration of cyclopropane. Heart rate and blood pressure were taken every 10 minutes with a clinical sphygmomanometer. Precautions against explosion were rigidly enforced.

After preparing the subject, the experimenter recorded 64 control evoked responses. Next, the experimenter used the descending method of limits to make four determinations of absolute threshold for shocks to the right wrist. During these controls, the subject breathed room air. He then breathed two to five different concentrations of cyclopropane through an anesthesia mask attached to a nonrebreathing system vented to the out-

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doors. The subject usually required 30–45 minutes to equilibrate at each concentration, whereupon neurophysiological and psychophysical observations were repeated. Following exposure to the last scheduled concentration, the subject breathed room air for 30 minutes prior to final control observations. The subject then was moved to the recovery room and observed until medically ready for discharge.

No subject lost consciousness during the study. All remained responsive to commands. Most reported that at higher concentrations of cyclopropane they had felt detached from their environment, experienced a sensation of "floating," and being unconcerned with the passage of time. Subjects sometimes reported having dozed between tests. These phenomena are consistent with the EEG, which usually showed alpha rhythm during inhalation of cyclopropane.

As end-expired concentration of cyclopropane rose, evoked extracranial responses diminished and in three subjects disappeared completely. The sensitivity of evoked responses to the anesthetic varied widely between subjects. Such variation is a common clinical experience to anesthesiologists.

Despite dramatic reductions in early and late evoked extracranial responses, all subjects displayed relatively minor increases in psychophysical responses. Cyclopropane never doubled thresholds for any subjects until concentration reached 3.0 percent. Stimulus intensities used to test evoked responses remained well above the elevated psychophysical thresholds. At all concentrations, subjects could discriminate suprathreshold stimuli of different intensities. Subjects also responded to such changes in instructions as a request to press the pushbutton twice instead of once when they felt a shock.

No other physiological changes were noted during the studies. The peripheral neurograms from ulnar nerve showed no systematic effects of cyclopropane. Blood pressure, heart rate, and respiratory P_{CO_2} remained within control limits. Inhalation of room air at the end of the study reversed the physiological and psychological changes induced by cyclopropane. Cerebral evoked activity once again became obvious and absolute thresholds returned to control levels.

The ability of cyclopropane to abolish early as well as late evoked activity is the main finding of this study. Stimulus detection and discrimination of intensity in somesthesis persist after elimination of extracranial evoked responses. Since fluid and tissue between the brain and a scalp lead attenuate evoked responses, we cannot claim that all cerebral evoked activity vanished in those subjects who lost extracranial potentials. Even with this qualification, these data indicate that extensive parts of normal specific and diffuse evoked cerebral somatic responses are unnecessary for at least some sensory experiences. Although evoked activity may encode various stimulus parameters, it may play no essential or important role in determining perceptual reactions to those parameters.

Paperback Psychiatry

CARL H. FELLNER

Critics of medical education doubt whether our young doctors are adequately trained, and this concern has led medical schools to revise their curricula. Despite these improvements, prospective physicians are not being educated in the fullest sense of the word. Specialization in the sciences and neglect of the humanities begin early in undergraduate training. Although many medical colleges recommend a broad background in the humanities and social sciences, advisers often steer the undergraduate into sciences. The future doctors usually have taken only the minimal number of courses in the humanities.

One can become an educated man in other ways. But do our medical students, interns, and residents make use of cultural opportunities? The answer is mostly no. And neither do most physicians participate as much in cultural life as their positions of leadership in the communities should warrant.

This situation is of particular concern to those educators who specialize in the teaching of the behavioral sciences. Everyone in medicine subscribes to the concept of treating the "whole man." In the field of psychiatry, understanding of the whole man in a particular social class and a specific subculture is of central importance. In teaching psychiatry we have two psychiatries to consider: the first composed of concepts and facts and the second involving "empathic understanding." It is this ability to become aware, plus the ability to communicate this awareness, which transforms the case history into an encounter and leads into psychotherapy.

In medical school the student is introduced to the attitudes of objectivity and noninvolvement. This reinforces the cultural habit of relegating identification and emotional involvement to situations especially created for their display, such as the theatre, television, or literature. While it is necessary for the student to acquire sufficient objectivity to perform an autopsy or tolerate death, we must not neglect the task of helping him to maintain his human sensitivity and an awareness of his own emotional reactions. This can be done by taking advantage of existing cultural forms, by using the rich and often profound material in paperback novels, essays, or dramas.

During the last six years at Wisconsin sophomore medical students have been offered an elective course in psychiatry in which contemporary novels and plays are studied.

Enrollment has been restricted to groups of eight or ten students each that meet informally weekly or biweekly for one semester. Each meeting lasts for one-and-a-half to two hours under the leadership of a staff psychiatrist or psychologist. A similar seminar has been organized for psychiatric residents and, as the next step, a seminar for residents and their wives is being planned.

The course has three basic objectives: to reintroduce the student to literature—to rekindle his interest in novels, plays, and poetry; to use playreading and acting as a medium for

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teaching empathy; and to teach through direct involvement techniques of communicating this twofold awareness. The fact that the professor who leads the seminar is not an expert in literature and does not speak with the voice of authority in this enterprise permits free and active exchange of opinions and feelings.

The seminars have been offered on an experimental basis and so it has been easy to change the format rapidly. The groups have moved from discussion to dramatic presentation and acting out of situations from the books, and then to dramatizations of interactions derived from but transcending the actual play or novel on which they were based. For example, the initial treatment of Camus' *The Stranger* was through discussion; but subsequent groups reenacted a jury session, beginning with the summing-up of the prosecution and the defense of two seminar members and leading to a debate by the rest of the participants, who, as the jury, had to arrive at a verdict. Another example is Miller's *Death of a Salesman* in which the participants played members of Willy Loman's family, who had been called together to discuss whether or not they should do something about Willy and, if so, how to implement their decision, including the confrontation of Willy with their desire for a psychiatric family consultation.

At the conclusion of the course each participant submits an essay discussing his reactions to and suggestions for the course. Almost all students are appreciative of the opportunity to reacquaint themselves with literature. The intensity of their involvement is observable in their attendance and in their performance in the seminars, as well as in the discussions which often continue outside of the classroom.

The strongest expression of approval came from the residents who asked to have their own sessions and who then requested a program that would include their wives. Criticism has been expressed by a small minority of students who have felt uncomfortable with the loose structure and personal involvement demanded, and who would have preferred the conservative and distant "patient presentation" approach.

Following is a list of the paperbacks used since initiation of the course: Albee, *The Zoo Story;* Anouilh, *Antigone;* Beckett, *Waiting for Godot;* Bellow, *Seize the Day, Henderson the Rain King;* Camus, *The Stranger;* Dostoevsky, *Notes from the Underground;* Faulkner, *As I Lay Dying;* Hess, *Steppenwolf;* Joyce, *Portrait of the Artist as a Young Man;* Kafka, *The Trial;* Lawrence, *The Man Who Died;* Mann, *Death in Venice;* Maugham, *The Servant;* McCullers, *The Ballad of the Sad Cafe;* Miller, *Death of a Salesman, View from the Bridge;* O'Neill, *Long Day's Journey into Night;* Rilke, *Notebooks of Malte Laurids Briggs;* Sartre, *No Exit;* Tolstoi, *The Death of Ivan Illyich;* and Updike, *Rabbit Run.*

Training in Psychoanalysis in Groups Without Face-to-Face Contact

ALEXANDER WOLF, EMANUEL K. SCHWARTZ, GERALD J. MCCARTY, and IRVING A. GOLDBERG

There are precedents for the use of the telephone as a medium for training. Such endeavors have been a didactic form of teaching without opportunity for interaction, although recent developments may add this dimension. It is becoming increasingly possible to teach at a distance not only without serious loss of interpersonal contact, but with additional benefits.

Two trainees met together in Seattle and used a speaker telephone for supervisory sessions with the two training analysts who met together in New York. Each session was tape-recorded, transcribed, and distributed to participants prior to the subsequent meeting. Supervision took place once a week for one hour, for approximately four years. For a brief time during the third year, an additional trainee participated by telephone from Atlanta.

There are at least two principal views regarding supervision. One is that supervision is didactic, a learning experience that does not investigate the affective problems of the student. A more classical view is that supervision is a continuation of personal analysis. A third and intermediate position is that training requires the communication of information in a context of overt affective exchange.

Effective learning is not purely intellectual. In learning to work with patients, there need to be an awareness of transference and countertransference, understanding of the interrelationship of the supervisee and supervisor, their exploration, as well as a cooperative effort to overcome learning blocks. In analytic training programs, it is considered essential that the student have a personal analysis, in addition to supervision, to deal with the deeper levels of his real and illusory involvements.

Supervision should provide the free discussion by the student of his reactions to the patient and to the supervisor. These exchanges form the groundwork for the learning of theory, technique, and the clinical management of the patient.

In the group supervisory process, the students' reactions to patients and to each other as well as to the supervisor form the matrix for theoretical discussions and for the presentation of clinical and didactic material. The opportunity for interaction with peers has been shown to be a valuable asset in training, because the students seem to learn much from one another about how to work with patients in the individual as well as in the group setting.

In our telephone-supervision experience we observed, among other things, that when the participants were deprived of sensory evidence in reality, anxiety arose which provided defensive maneuvers. The participants did not have the visual cues and nonverbal reactions, such as facial expressions and gestures and the furnishings of the office and waiting room, to which one would have access in a face-to-face situation. They were de-

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prived even of a range of sounds, masked or obliterated in the telephone exchange. The emphasis and focus were on voice only. Whispers between participants at either end of the line could be heard but not understood. Only what was spoken directly into the microphone was received at the other end.

As a consequence, transference reactions and fantasy elaborations were stimulated. At times, the interaction took on a quality of the magical play of the child who creates a telephone out of tin cans and string in order to communicate with another child. An example of a shared fantasy occurred when there was joking about the use of Telestar as the medium for communications; outer space would be employed to conquer inner space.

Even the peer relationship had a fantastic playful quality similar to the secret societies of children. This was evident in the reluctance of the students to accept a new student and the resistance of the teachers to the introduction of another telephone supervisor.

The telephone sessions occasionally took on a quality of spontaneity, a freedom and playfulness, in contrast to the seriousness which is customary in supervision. There may be some similarity here to the alternate session in group therapy. The great distance, the feeling of separation, and the use of an instrument for contact may have contributed to the attenuation of the vertical vector, as does the physical absence of the therapist during the alternate session.

The supervisors observed that they became more rapidly aware of their real and projected feelings about the students. The discussions involved some exploration of transference and countertransference reactions of the supervisors to each other, to the trainees, and to the patients being treated by the trainees.

The telephone lent itself easily to the projective coping mechanism of blaming the equipment when the trainees would not hear a comment by the supervisors aimed at the penetration of transference or countertransference problems in the management of patients. The tendency of one to focus on the telephone seemed to be a defense to relieve the anxiety of the distance. An unconscious reaction of one supervisor was that he consistently found himself talking loud to make sure that his voice was being heard over the 3,000 miles. Another compensatory mechanism was the conviction of one supervisee that the supervisor with whom he identified most strongly was enraptured with the discussion. It was revealed that the actuality was different.

The fact that the trainees had face-to-face contact with each other, as did the supervisors, had a countering effect in that the proximity of the trainees lessened the anxieties of isolation from the authorities. Face-to-face contact tends to increase awareness of reality factors.

At the outset, there was a variety of responses on the part of the trainees. Clinical summaries of patients in group treatment and transcripts of group therapy sessions were prepared and presented in a competitive and rivalrous attempt to woo the supervisors. Resistance to the exploration of feelings took place behind a formal presentation or a demand for discussion of theory. Sometimes it took the form of trying to focus on the patient

and to solicit from the supervisors that kind of direction which would constitute their treatment of the patient through the supervisee.

As the search for structure and the competitiveness began to be better understood, these trends diminished. A more spontaneous interaction developed which was less related to time considerations, and the quality of interaction improved.

It is important to emphasize some of the cognitive content and didactic aspects of the supervision. Problems of time management during group sessions, financial arrangements, seating plans, patient selection and group composition, as well as other structural matters were repeatedly discussed. Theories of psychopathology and psychodynamics were evaluated. Clinical problems and their technical implications were part of each session. The supervisors had the impression that more information was communicated per unit of time than seemed to be the case in face-to-face supervision.

The supervisees made changes in the techniques they utilized in group treatment. Both discontinued the routine use of individual sessions, and made the group the central medium for treatment. They introduced alternate sessions, and focused on dreams, interactive associative material, resistance and transference with a depth of understanding not discernible prior to the telephone supervision. Time was spent in clarification and discussion of the literature of psychoanalysis with particular reference to transference, transference neurosis, regression, and the observance and interpretation of these phenomena in the treatment sessions.

The effect of the presence of visual cues in the horizontal vector between the two trainees and between the two supervisors needs to be called to attention. The existence of two psychologic fields, one with and one without visual cues, allowed for the discussion of comparisons similar to those that exist between behavior in the regular and the alternate session. It also led to an exploration of cliquing behavior or the overidentification of one participant with another.

It is possible that the positive reactions of all the participants toward their experience were partly determined by the fact that the supervisees had prior experience together on the level of collegial and friendly relations, as did the supervisors, although the two supervisors had only one contact with the two supervisees before beginning supervision. The results may be different if the experiment is repeated with four strangers.

This kind of supervision can be undertaken with individual or group psychotherapists. Many professional persons may be able to refine further their knowledge of therapeutic techniques where training is not available on a local basis, if they are willing to forego face-to-face contact. And even where face-to-face supervision is the prevailing condition, an additional dimension can be added by a supervisory experience without visual cues.

The Normal Dependencies of Aging

MARGARET BLENKNER

This paper is addressed to dependency as a state of being—a state of being in which to be old—as to be young—is to be dependent. It is not pathological, not wrong. These normal dependencies may be reduced to four basic categories:

Economic dependency stems from having crossed over from the productive to the consumer status. The older person typically finds himself dependent on income transfers from the working generation, provided through taxes but also in contributions from children and other relatives.

Physical dependency arises from the fact that muscle strength diminishes, sensory acuity decreases, reflexes are slower, coordination is poorer, and level of energy is lower. The ordinary chores of living become difficult, strenuous, and eventually impossible.

Mental dependency occurs more slowly and is not a source of dependency until advanced old age. When deterioration or change in the central nervous system produces deficits in memory, orientation, comprehension and judgment, the old person must rely on the cognitive functions of others.

Social dependency develops out of many factors and losses. As the individual ages, he loses *persons* who are sources of affection, stimulation, and assistance and *roles* that are the basis of status and power. He becomes increasingly dependent on recognition by others of his *rights* rather than his *power*.

There are three sources of help or solutions for the normal dependencies of aging:

"Self-solution," whereby the older person seeks to modify his behavior or circumstances. He balances his budget by restricting consumption; conserves his energy by restricting activities; bolsters his memory by writing notes to himself; counters his social losses by social disengagement. Such maneuvers are sensible and valid ways of coping, up to a point; beyond it they become pathological and dangerous until they jeopardize the sanity and survival of the individual.

The "kinship solution" requires the existence and proximity of children or other relatives. For the aged who are fortunate enough to have concerned and capable kin, most of their needs can be met by the care-giving services of such kin. These too are sensible and valid solutions up to a point. But an excessive burden can so overwhelm a family as to endanger its members' physical, emotional, and social stability, or result in rejection of the old person with accompanying guilt and suffering.

The "societal solution" consists of arrangements or programs through which society assists its members to cope with needs and problems beyond the resources of the individual or his primary group. Under the impact of modern living conditions there is need to develop and expand imaginative and inventive societal solutions to the normal dependencies of aging.

Condensed with permission from Kalish, Richard A. (Ed.), The Dependencies of Old People. *Occasional Papers in Gerontology*, No. 6. Institute of Gerontology, University of Michigan—Wayne State University, August 1969.

Except for Medicare, we have made little or no progress in the United States toward realistic societal solutions to problems arising from the normal dependencies of aging. Professional social work acts as though counseling and custodialism were answers to the problems of growing old in America. Attempts to encourage new programs geared to the aged are met with the Social Work Establishment's cry, "duplication of service!" Anyone who is not naive knows it never is raised in defense of clients, only budgets. No clients ever complained of duplication of service. Most would welcome the opportunity for comparative shopping.

We are further along the road to solution in the economic sphere than any other. The obvious answer to economic dependency is to supply money or to pay bills. This is what we have done, but we have done it penuriously and demeaningly.

We could take care of this by instituting universal coverage of all retired or disabled persons 60 years and over, and making the minimum benefit sufficient to secure a modest but adequate standard of living. We could and probably shall do these things before too long, regardless of which party dominates the political scene.

Neither old age insurance nor old age assistance is meeting the economic need of our older citizens. If they were, the old would not comprise one-fourth to one-third of the poor. The war on poverty, in the aged sector, can be won easily as soon as we grant that the main cause of poverty is lack of money.

We already have moved toward the universal demogrant in extending Social Security coverage to persons without a history of eligible employment. To end most of the poverty among our older citizens we need only extend coverage to all retired persons over a given age, and increase substantially the minimum benefit. For those who worry about the oldster who might get money he doesn't need, changes in income tax laws could tax it right back.

Satisfactory solutions to dependency needs in other areas hinge on first solving the problem of economic dependency.

Problems of physical dependency may be met by various living arrangements of an institutional or semi-institutional character, or by services delivered to the old in their own homes or those of relatives or friends. Despite lip-service to "keep the old in their own homes," most money and manpower directed toward services and facilities for the aged are designed to remove the old from their homes.

We have subsidized development and expansion of the proprietary nursing home into a major industry. Private philanthropic money is nearly all concentrated in congregate care facilities, as is professional personnel employed by the voluntary agencies to serve the aged. An extensive system of home help services (visiting housekeepers or home aides, home handymen and maintenance aides, transport and escort aides, etc.) is underdeveloped in the United States. Worse, under the impact of Medicare, such service as has been developed is being sidetracked into a restricted type of health care, instead of being developed in its own right as a major societal solution to the normal physical, mental, and social losses incurred in old age.

The crying need in the field of home help services is for creative

thinking and the planning of ways and means to finance and structure such services to reach the mass of older people and their families.

Solutions to social dependency have become confused with solutions to mental dependency. This is evident on the social welfare scene in the newly developing programs of "protective service." Although directed toward the aged person whose behavior is such as to render his mental competence suspect, a review of services usually included under the "protective service" rubric reveals that many of them may be needed by any old person at one time or another, especially if he is without relatives, friends, or personal agents to help him.

There is danger in such confusion. Although done with the best intentions, it tends to cast an aura of marginal mentality and civil status over all older persons seeking social services. It reinforces the tendency to deny self-determination to persons in the client/patient role, to assume that the professional always knows best.

No one has demonstrated that the average client cannot do just as good a job as the average caseworker in deciding what his problem is, and what service would be most effective in solving or ameliorating it. With old people who have managed their lives and filled their social roles adequately, this is a tenable hypothesis.

I'll never forget an old man who applied for an apartment. We gave him the works in the way of study and diagnosis. Altogether it was a glorious interdisciplinary experience in psychobiosocial diagnosis for all—except the old man. After we concluded that he was a proper candidate, he was called in and the service director informed him of our decision. Puzzled by his somewhat flat response, she asked, "Aren't you pleased?" The old man sighed: "That was a hell of a lot to go through just to rent a room!"

My enthusiasm for professional procedures has been somewhat tempered ever since.

Solutions to social dependency may be confused with economic solutions, as witness the programs to put old people to work in hospitals, clinics, schools, social or recreational agencies, and beautification efforts. Does the activation of such programs meet a basic social need for a considerable number of the aged, or does it serve to distract us from the issue of inadequate Social Security benefits?

Confusions and contradictions such as these reflect the difficulty we in the social and behavioral sciences, and the applied fields of social welfare and mental health, have encountered in coming to grips with normal old-age dependency as a development that must be planned and provided for, and is unlikely to be cured, treated, rehabilitated, or exorcised away.

Information and Misinformation About Drugs

SIDNEY COHEN

How do people find out about mind-altering drugs? What is the quality of the information? How are their attitudes formed? What enhances or deters drug-taking behavior?

The direct person-to-person message has been and remains a potent vehicle for transfer of information. It is especially powerful in the drug area because it carries both the conviction of personal experience and the emotional loading of the transmitter. In a study of drug-taking networks within relatively closed groups, it has been found that drug usage spreads centrifugally by word of mouth especially when the initial source is charismatic or occupies a position of leadership.

But the enormity of the psychedelic experience is such that it is accepted by the credulous without thoughtful evaluation. Identical subjective phenomena are called "mystical union" by one, and "depersonalization and derealization" by another. Visions and insights for one may be hallucinations and delusions for another. Very often the "good trip" is no different from the "bum trip" except that one person relishes loss of control and becomes ecstatic, while another becomes panicky and horrified.

Words are potent shapers of behavior, but nonverbal messages are also powerful. Especially in the young, mimicking activity of valued others is pervasive. Simply being a member of a drug-using subgroup makes the probability of indulgence likely. To ape, to copy, to imitate, these activities are doubtlessly genetic imprints.

At another level of discourse the user turns on the non-user with "It's harmless, I've taken it." This sort of claim returns us to the age of innocence of herbal folk lore and the patent medicine testimonial. The heavy cigarette smoker, the woman who took thalidomide during the seventh week of pregnancy, and the joy popper of heroin all could make similar assertions. If only things were that simple.

The person-to-person interchange is the most important source of information and misinformation. I suspect that the tongue is mightier than the pen in moulding human behavior. This is so because it allows for an exchange, an interaction, and a transfer of emotional as well as verbal messages. Small groups are more effective than large groups, and one-to-one transactions have the greatest impact of all.

The mind-altering drugs themselves are a communicative and sometimes a symbolic message. Their statements may be anything from "Feel better" to "Expand your consciousness." These are beguiling messages, for who does not want the promise of euphoria or Nirvana? But the question remains: Is the pearl of no price a pearl? Is the unearned Paradise worth only what one has paid for it? To me it is astonishing how quickly the insights and the enlightenments fade, and little has changed except the illusion of change.

Another source of information is what may be called the old literature. Drugs like cannabis, opium, and

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peyote have been around a long time and a vast literature is available. This collection of materials is highly variable for much of it seems to have been written by biased or poorly trained reporters. The descriptive content is interesting, but the conclusions should be accepted with reservation. We are only now laying the foundation for the scientific study of cannabis.

As one scans the array of tales about drugs, one impression prevails. The strenuous and pervasive efforts of men to alter their consciousness is hardly new, nor have the reasons for drug usage changed substantially. They want to feel better. They are bored, in pain, frustrated, unable to enjoy, or feel alienated. Some plant carries with it the promise of oblivion, surcease, quietude, togetherness, or euphoria. Modern technology has now added intoxicants, deliriants, ataractics, confusants, dissociatiants, calmators, and alertors.

We tend to extract from the earlier archives those quotations that fit our prejudice. Thus, the LaGuardia report is used by both sides to demonstrate both the safety and the dangers of marihuana. Similarly, in the ancient ideographs we read that hashish was an enhancer of meditative and of assassinative activity, and can proceed to select that quotation which fits our preformed judgments.

Some latter-day research reports are not lacking in ambiguity, improper design, and drawing of conclusions from insufficient data. It is in the nature of early scientific efforts to produce much that is irrelevant or downright incorrect. That Kepler turned out to be wrong in many of his theories and calculations does not reduce his importance.

Let me cite two examples of what I consider unwarranted conclusions from our current research reports.

There have been dozens of experiments on chromosomal changes in connection with LSD exposure. We are confronted with a stack of articles by capable researchers, some of whom have demonstrated chromosomal structural changes, and others who have not been able to replicate this finding. I do not know what the score would be if we listed the positive and the negative reports, but it may well be a tie.

We are aware that a number of commonly used drugs and other chemicals are capable of chromosome rearrangement. What does all this mean? What should we say at this moment in time regarding the actual cause-effect relationship between LSD and subsequent genetic disorders in the individual or his progeny? Today, the question can only be placed in the "hold basket."

Another example of overinterpretation of results, if not by the authors, then by those who read the article, was a driving simulator test comparing alcohol and marihuana. The dosage level for marihuana was a "normal social high," or two cigarettes of unknown strength. The dosage level for alcohol was a 0.1 mg % blood level. These amounts hardly seem equivalent, yet the article implies that driving under alcohol is more hazardous than driving under marihuana. It would have been much more desirable to derive dose-response curves on these two substances than to extrapolate from unequal dosage levels of marihuana and whiskey.

There is nothing wrong with saying, "We do not know" when we do not

know. Nor does "We don't know" mean "It is harmless."

In speaking of research findings and sources of information about drug abuse, I must not fail to mention the availability of annotated bibliographic reference material stored at the National Clearinghouse for Mental Health Information. Other data banks are available for similar services.

Much has been written, broadcast, and televised about drugs and drug abuse. Without question, the public information systems have had an important, perhaps a decisive, effect upon the drug scene. At the turn of the century Weir Mitchell and Havelock Ellis spoke as glowingly of their peyote experiences as Aldous Huxley and Allan Watts did of mescaline and LSD in the early 1960s.

The mix of mass media material has varied from excellent to terrible. By terrible I mean sensational, inaccurate, and misleading. This is natural, because news is that which is new or novel. The need to emphasize the unique, the esoteric, and the strange is inherent in the papers, radio, and TV. Television and radio are especially difficult media for transmitting information that requires thoughtfulness.

Then there are the underground newspapers. Just why they are called "underground" when they are so above ground is difficult to understand. Originally, the latter-day underground press was drug centered, and the information was often enough lacking in accuracy, but sometimes the facts were "straight."

At the point when large numbers of people are misusing alcohol, uppers, downers, psychedelics, and an assortment of other chemicals, we must ask what can be done to reverse this trend. First we must recognize that this is no fad that will yield to next year's equivalent of goldfish swallowing. More dangerous agents seem to be displacing the less dangerous ones. Then we must acknowledge that events outside the drug scene may have a greater impact on the problem than any direct effort.

All of us acknowledge the need for more research, more skillful education, and more accurate information on drugs of abuse. Still we cannot expect too much, too soon from research and re-education.

Nor will attempts to legislate drug taking out of existence solve the problem. The modification of human behavior by the threat of legal punitive action is a relatively poor technique of accomplishing the desired end. If the punishment invariably or frequently followed the aversive behavior, it might be successful. When the chances of punishing the lawbreaker for a drug possession violation are probably less than one in a thousand, we can expect little behavior modification. If the sanctions are excessive as in the case of simple possession of marihuana, the ills they engender exceed any benefit.

Does all this mean that nothing can be done to influence the rising incidence of drug abuse? Not at all. What could transform the bedrugged scene relatively rapidly is a viable equivalent for spurious promises that drugs proffer. If people turn to drugs because they feel alone, are hurting physically, or consider their existence irrelevant, then valid alternatives to chemical awareness must be developed.

The Clinical Symptomatology of Amphetamine Psychosis and its Relationship to Amphetamine Levels in Urine

B. M. Angrist, J. Schweitzer, A. J. Friedhoff, S. Gershon, L. J. Hekimian, and A. Floyd

Amphetamine was introduced into the pharmacopoeia in 1932 as a decongestant and in 1935 its central stimulating effects were used in the treatment of narcolepsy. Since then, it has been prescribed as an anorexigenic agent, as a stimulant in states of fatigue and drug-induced central depression, and for mild depressive states. It has been used in child psychiatry, especially to alleviate hyperkinetic behavioral disturbance, and for such diverse conditions as postencephalitic Parkinsonism, enuresis, and certain psychopathic syndromes.

Perhaps this widespread use has led to misuse. However, it is mainly the effects of amphetamine on mood that have led to its prominence among the drugs of abuse. The issue of a possible relationship between amphetamine, psychosis, and chronic schizophreniform symptomatology is unresolved. This study deals with patients with amphetamine psychosis some of whom show total clearing and some of whom clear of acute symptoms only to remain with residual schizophreniform pathology.

All admissions to Bellevue Psychiatric Hospital were screened for patients in whom the onset of behavioral aberrations or psychiatric symptoms coincided with the self-administration of amphetamine or methamphetamine. These patients were transferred to a research ward for behavioral observation and urine collection. Phenothiazine medication was withheld.

Behavioral data were collected with a 50-item rating scale that parallels the format of the standard mental status examination. The psychiatric profile was assessed daily until acute symptoms subsided and the patient became amenable to more prolonged interview. At this point, retrospective reconstructions of the acute episode were undertaken and the past history was explored with attention to early development, school adjustment and performance, childhood socialization patterns, evidence of past behavioral disorder, "soft" signs of central nervous system dysfunction, and sexual, occupational and military adjustment.

Urine was collected daily in 24-hour samples from the time of the patient's arrival on the ward. Amphetamine levels were assessed by gas chromatography.

Behavioral observations and urine collections continued until discharge. After the patients' clinical course became stable and no further behavioral change was noted, the patient was seen, prior to discharge, in diagnostic interview by two psychiatrists. These psychiatrists had minimal or no contact with the patient during the acute phases of his symptomatology and were kept unaware of the rating psychiatrist's diagnostic impression. On the basis of this interview, the patient was assigned to one of two study groups. The first of these groups, (C), showed complete clearing of sympto-

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matology. A second group (RSP—residual schizophreniform pathology) showed clearing of acute symptomatology but persistence of residual affectual blunting or incongruence, thought disorder, and in some cases, chronic delusional ideation. These features were clinically indistinguishable from those noted in chronic schizophrenic patients in relative remission. Two groups of 10 patients each are compared in this report.

Demographic data—Mean age of the C group was 23.4 and of the RSP group 26.4 years. There were no differences in sex or race. Educational levels were the same with means of 11.4 years (C) and 11.95 (RSP). Only three of the C group and two of the RSP group had recent gainful employment.

Past history—For other drugs taken the only difference between the groups was a history of heavy alcohol use among 70 percent of the RSP group compared to 20 percent of the C. The RSP patients had also taken a somewhat more diverse group of drugs.

The developmental pattern showed greater similarities than dissimilarities.

Nocturnal enuresis was noted in five out of 20 patients while temper tantrums were present in four. Academic adjustment was poor in both groups: Disciplinary problems were noted in eight, peer relationships were disturbed in five, and academic failure was noted in 10. Poor application rather than difficulty in comprehension was the usual reason cited. Work adjustment was poor in each group.

Both groups had histories of antisocial behavior. Arrests were admitted for petty larceny, Sullivan Law violations, drug possession, vagrancy, shoplifting, confidence rackets, assaults, trespassing, auto theft, glue sniffing and molesting children. In addition, six (three RSP, three C) were homosexual and three had made suicide attempts (all RSP). Medical history showed five cases of hepatitis, all in patients who had used amphetamine intravenously. The RSP group had 29 previous psychiatric hospitalizations while the C group had 20.

Of all the symptomatology examined, only scores for gross behavioral disturbance showed a significant difference for the two groups. This appeared not in the initial scores but in a comparison between the rates of clearing for the two groups. Here the C group showed significantly faster restitution of behavioral pathology.

Duration of symptomatology—Hallucinations cleared equally rapidly in both groups, while delusions and behavior disturbance showed significantly more rapid clearing in the C group than in the RSP. Disordered thinking and affectual blunting and incongruence occur initially in both but are not included since they constitute the main criteria for assignment to the RSP group.

This study supports the contention that amphetamine-induced psychosis may mimic paranoid schizophrenia in all respects. We did not find a significant tendency toward the occurrence of visual hallucinations in those patients who had the typical acute syndrome with total clearing and auditory hallucinations in those patients who, upon clearing, showed residual schizophreniform pathology.

While the type of thinking disorder characteristic of schizophrenia was initally some what more prevalent and

lasted longer in the RSP group (and was used as a criterion for assignment to that group), it was also noted initially in those patients who cleared completely. Thus, it does not appear to be an absolute criterion for sorting the two groups in the acute phase of the intoxication. In a larger series differences in initial intensity and rate of clearing might have emerged.

Delusions and behavior disturbance were prominent in the acute phase in both groups but cleared rapidly in those who showed complete clearing and tended to remain pathological significantly longer in those patients who showed residual schizophreniform pathology. Affectual blunting and incongruence was also noted as a presenting symptom in both groups; and initial scores were approximately the same for the two groups.

These similarities in the presenting psychiatric profiles represent support for those investigators whose work has indicated that amphetamine can produce in normals a model psychosis that more clearly mimics endogenous schizophrenia than does any other psychotomimetic. These same investigators have reported marked variation in individuals' vulnerability to the psychotogenic effects of amphetamine. The wide scatter of our patients' initial excretion rates is consistent with this observation.

The findings in regard to hallucinogenicity were unexpected. There appeared to be a consistent trend for this symptom to be the first to clear in both patient groups. This suggests that hallucinatory experience during amphetamine intoxication is the direct or indirect result of the amphetamine and that its clearing relates more to amphetamine excretion than to features of the mental status that emerges after acute symptoms remit. Equally unexpected was the close correlation between paranoid delusions and urinary amphetamine levels.

A more global interpretation of these findings is difficult. One could argue that the group with residual schizophreniform pathology had preexisting schizophrenia *or* that this outcome was etiologically related to the intoxication per se. The histories of the patients were qualitatively similar, so much so that the two were nearly indistinguishable from this point of view. This would tend to support those investigators who suggest an etiologic relationship more than the formulation that the two groups were grossly different from the start.

Or, one might argue that schizophrenia is a common entity, that people suffering from it often have recourse to drug use to alter their dysphoric feeling tone, and that it seems as great or greater an assumption to assign a causal role to the amphetamine intoxication than it is to cite the likelihood of preexisting psychosis to explain the outcome in patients who show incomplete clearing. The incidence of this outcome might be completely the result of non-specific psychological vulnerability and have little to do with the pharmacologic effects of amphetamine per se. It seems that definitive answers will be from long-term longitudinal follow-up studies to determine the incidence of the development of schizophrenia in documented nonschizophrenic amphetamine abusers.

Methysergide in Mania

Alec Coppen, Arthur J. Prange, Jr., and Peter C. Whybrow

There is evidence of abnormal indoleamine metabolism in the affective disorders, particularly in depressed patients. In mania the role of amine metabolism is less clear. Reports that methysergide—a tryptamine and 5-hydroxytryptamine antagonist—produced improvement in manic patients within 48 hours were made in uncontrollable trials, and it seemed desirable to confirm them in a controlled trial.

Patients with an unequivocal diagnosis of mania were selected, were rated as moderate or severe, and had had at least one previous attack of mania or depression which responded to treatment. The patients received placebo or 6 mg. daily methysergide for 8 days and were then switched to the other tablets for 8 days. Ten patients completed the trial.

Analysis of variance indicated that methysergide had no significant advantage over placebo and, indeed, was significantly less effective in reducing talk and behavioral disturbances. The ten patients as a whole showed a slight but significant improvement in activity, talk, and behavioral disturbance but not in mood, when their final rating was compared with the baseline.

Several explanations of this lack of therapeutic response should be considered: insufficient duration of treatment, insufficient dose, or inadequate penetration into the central nervous system.

A further explanation is that there is no increase in brain 5-hydroxytryptamine in mania and thus a 5-hydroxytryptamine antagonist is unlikely to be of value. Mania seems to be similar to depression in that manic patients have a low level of 5-hydroxyindoleacetic acid in the cerebrospinal fluid. This evidence militates against the rationale of using methysergide or any other 5-hydroxytryptamine antagonist in mania.

It has been suggested that a therapeutic effect of methysergide would stem from its role as a tryptamine antagonist, rather than its action against 5-hydroxytryptamine. But, so little is known about the role of tryptamine in the brain or whether it exists there in detectable quantities, in healthy man or patients with affective disorders, that the question remains unresolved.

The apparent failure of methysergide in mania might be explained if it were the catecholamines, not the indoleamines, which were abnormal in this condition. That in depression there is a relative deficiency of catecholamines in the central nervous system has been suggested. The notion that depression and mania are opposite biochemically has led to the hypothesis that there is an excess of catecholamines in mania. However, α-methyldopa, a drug reducing the synthesis of noradrenaline and 5-hydroxytryptamine, is reported a therapeutic failure in mania. This, together with the treatment failure of methysergide and low concentration of 5-hydroxyindoleacetic acid in the cerebrospinal fluid of manic patients, supports a concept of mania and depression being biologically similar rather than bipolar states.

Condensed with permission from *The Lancet*, 1 (No. 7602) : 338-340, 1969.

Federal Legislation Related to Mental Health Introduced in the Ninety-First Congress, First Session (to September 15, 1969)

"Community Mental Health Centers Amendments of 1969," S. 2523, introduced by Senator Yarborough (D-Tex.), July 1, 1969

The bill would extend Centers' construction and staffing grant authority for an additional five years, 1971 through 1975, inclusive, at the graduated appropriation ceilings as follows: Grants for construction of community mental health centers—$95 million for FY 1971; $115 million for FY 1972; $115 million for FY 1973; $135 million for FY 1974; and $135 million for FY 1975. Grants for initial staffing of community mental health centers and of new services in such centers—$60 million for FY 1971; $60 million for FY 1972; $80 million for FY 1973; $80 million for FY 1974; and $100 million for FY 1975.

It would extend the overall duration of the support period for staffing grants from the present 51 months to 10 years, and lengthen the initial and maximum Federal support period from 15 months to two years. In areas designated by the Secretary of DHEW as urban or rural poverty areas, however, the bill provides preferential matching for both construction and staffing costs. For construction, the Federal share could be up to 90 percent instead of the present maximum 66 2/3 percent. For staffing, it could be 90 percent for the first two years and up to 75 percent for each of the next eight years. Present provisions are 75 percent for the first 15 months and 60 percent, 45 percent, and 30 percent, respectively, for the next three years for all areas.

The bill proposes to eliminate the lower limit (33 1/3 percent) in existing law on the Federal share of construction costs. It would also repeal present requirements that the State submit its proposed variable Federal shares for each construction project and the method used to determine such shares for Federal approval as part of its State Plan. It substitutes a requirement that the State notify the Secretary of the shares established and the method used prior to approval of any particular project, and that it may not change the share or method again that fiscal year once the project is approved.

The bill would authorize, in urban or rural poverty areas, grants for initiation and development of community mental health center services. Such grants could be for 100 percent of the costs or $50,000, whichever is less, and may be for a one-year period only, For these grants, up to a maximum of 5 percent of all Centers' staffing, funds appropriated each fiscal year are to be available to the Secretary, who, before approving such grants, must receive satisfactory evidence that persons broadly representative of, and actually residing in, the areas to be served will be given an opportunity to participate in the development of such programs.

Another amendment would

broaden the definition of personnel whose services would be eligible for Federal staffing support by eliminating the present restriction to "professional and technical" personnel only.

The percentage of construction funds available for administration of the State construction plan would be increased from two percent or $50,000, whichever is less, to 5 percent or $50,000, whichever is less. In addition, use of these funds would no longer be limited to administration of the construction plan only, but this would be authorized for administration of any State plan required under "this Act."

The bill makes the cost of land acquisition a permissible construction cost, and extends the deadline for promulgation of the Federal construction percentages for one month, from August 31 to September 30.

"The Community Mental Health Centers Amendments of 1969," H.R. 13163, introduced by Rep. Staggers (D-W.Va.), July 29, 1969

The bill extends the present construction and staffing programs for community mental health centers, for alcoholism facilities, and for narcotic addiction facilities for three years, through Fiscal Year 1973.

It extends the duration of staffing grants for all three programs from 51 months to 10 years, extends the initial and maximum period of Federal matching from 15 months to two years, and provides a higher matching ratio of 90 percent for two years and 75 percent for the next eight years for staffing grants to be made in areas designated by the Secretary of DHEW as rural or urban poverty areas.

Preferential matching of up to 90 percent is also provided for construction of mental retardation or mental health centers or for narcotic addiction facilities to be located in such poverty areas. Alcoholism facilities are not included, and the Federal ceiling remains at 66 2/3 percent.

Comparable construction and staffing authorization, including preferential matching for both construction and staffing projects in poverty areas, are provided in a new Part F to be added to the Centers Act, to provide Federal support for mental health services for children. Training and evaluation grants for the provision of such services are also provided, and given separate authorization ceilings.

A new training and evaluation grant program would be authorized for the alcoholism program as well. However, no duration is specified and no appropriations are authorized.

Up to 5 percent of all staffing funds appropriated for community mental health centers are to be reserved by the Secretary of DHEW to make grants for the initiation and development of community mental health services in areas designated as urban or rural poverty areas. These grants may be for 100 percent of the costs or $50,000, whichever is less, and may be for a one-year period only. The applicant must also satisfy the Secretary that he will provide for broad participation of persons actually residing in the area to be served in initiating and developing the program as planned.

Similar provisions are provided for the alcoholism and narcotic addiction programs, except that there is no requirement for broad community participation and the bill does not say that

the funds are to come from a percentage of appropriated funds set aside by the Secretary for this purpose.

The bill would also permit 2 percent (or $50,000, whichever is less) of the annual Centers' construction allotment to be available for paying up to one-half of the cost of administration of any State plan required under Title II. Present law restricts the use of these funds to administration of the State construction plan only.

Another provision makes the benefits of the extended duration of staffing grants and the availability of staffing funds for initiation and developmental grants apply to centers first funded prior to June 30, 1970 but whose Federal support has not yet terminated. These centers could continue to receive staffing grants beyond the period they are scheduled to terminate just as if the amendments had been in force at the time their grant was first awarded. This limited retroactivity does not include the preferential matching ratios.

One provision drops the 33 1/3 percent minimum grant requirement for Centers' construction projects and eliminates the requirement that the State submit for Federal approval, as part of its State plan, any variable Federal share percentages established and the method used to establish them, which must be based on certain enumerated objective criteria. Under this bill, a State would only have to notify the Secretary of DHEW of the variable Federal shares established, and the method used to establish them, with the provision that once a project is approved on that basis, the State could not again change either the established share or the method used during the same fiscal year.

"Comprehensive Narcotic Addiction and Drug Abuse Care and Control Act of 1969," S. 2608, introduced by Senator Yarborough (D-Tex.), July 14, 1969

Title I amends Part D of the Community Mental Health Centers Act relating to grants for narcotic addict rehabilitation services (P.L. 90–574). It would allow Federal reimbursement for 90 percent of the costs of "operation, staffing, and maintenance" for the first two years and reimbursement at a 75 percent level for the next six years. It also would allow Federal reimbursement for up to 90 percent of construction costs rather than 66-2/3 percent of costs under existing law.

Title II would add to the existing training and evaluation provisions of Sec. 252 of the Centers Act (P.L. 90–574) a research program relating to: personnel practices and needs in the drug abuse field; the adequacy of education and training resources of individuals in or preparing to enter the drug abuse field; and the adequacy of specialized training for health professionals who have occasion to deal with drug addicts. It also authorizes fellowship grants for training in drug abuse-related problems. Title II authorizes a drug abuse education program allowing grants and contracts for the collection, preparation, and dissemination of educational materials dealing with drug abuse and for the development and evaluation of drug abuse education programs directed at the public, children, and special high risk groups.

The National Institute of Mental Health is directed to perform seven functions relating to drug abuse education: serve as a focal point for collection and dissemination of drug abuse information; collect, prepare, and disseminate materials dealing

with drug abuse and its prevention; provide for preparation and conduct of public education programs; train people to organize such programs; coordinate Federal activities with respect to health education aspects of drug abuse; assist State and local health and educational agencies in establishing drug abuse education programs; and undertake other activities essential to a national drug abuse education program. The NIMH is also authorized to conduct workshops, institutes, and other activities for training personnel to work in the drug abuse education area.

Title III amends the Public Health Service Act to provide for research and study programs relating to drug use, abuse, and addiction. The NIMH would administer a grant program to: support and conduct research programs into all phases of drug use and abuse; make grants and enter into contracts for the conduct of investigations, experiments, demonstrations, studies, and research projects with respect to developing improved methods of care, treatment, and rehabilitation of drug addicts and abusers, and of improved methods of diagnosing drug addiction and abuse; make grants to State agencies which administer institutions for the care and/or treatment of drug addicts or abusers to develop and establish improved methods of operation; evaluate the adequacy of drug abuse prevention and treatment programs and make necessary planning studies; develop field trials and demonstration programs for drug abuse prevention and treatment; establish a National Registry of Narcotic Addicts to facilitate drug addiction research; and make project grants for the establishment, construction, staffing, operation, and maintenance of regional centers for research in drug abuse and related problems. One of these centers is to be a National Addiction and Drug Abuse Research Center as part of NIMH and is to be located in close proximity to the Institute's central research facilities.

Title IV concerns the control of dangerous substances. The Secretary of DHEW is authorized to: determine which substances should be controlled because of their ability to produce physical or psychological dependence which could lead to abuse; rank these substances in classes according to the extent of their ability to produce physical or psychological dependence and their relative capabilities for abuse; promulgate a list of such classes; and amend such list as he finds necessary in the light of new scientific knowledge. Only substances which are within the definitions of "narcotic drug" under the Internal Revenue Code or "depressant or stimulant drug" under the Federal Food, Drug, and Cosmetic Act may be included on the controlled substance list. The Secretary is required to consider the advice of an Advisory Committee on Narcotics and Dangerous Drugs and is to consult with the Attorney General before deciding upon the classification of a substance. The bill specifically removes marihuana from the provisions of the Internal Revenue Code and places it under the Federal Food, Drug, and Cosmetic Act where it would be treated like depressant, stimulant, or hallucinogenic drugs.

Persons or establishments wishing to conduct research with narcotics or marihuana must obtain an annual registration from the Secretary. Requirements for such registration include supplying any information required by the Secretary, adequate

procedures for accountability of drugs used, adequate safeguards against diversion to illegitimate uses and in the case of research with humans, State licensure to administer drugs. There are also various record-keeping requirements for registered researchers, which are added to the Internal Revenue Code.

Title V effects several transfers of authority from the Attorney General to the Secretary of DHEW. The Secretary rather than the Attorney General would have the authority to: designate a drug as a "depressant or stimulant" under the Federal Food, Drug, and Cosmetic Act; determine that a drug is an opiate under the Internal Revenue Code; and determine the country's medical, scientific, and other legitimate needs for narcotics for the purpose of establishing quotas both for the manufacture of narcotic drugs and for the amount of narcotics that should be imported or exported. Finally, Title V requires the Secretary to appoint a committee of experts to advise him with respect to any of the determinations pertaining to drugs which he is required to make under this Act's amendments.

"Controlled Dangerous Substances Act of 1969," S. 2637, introduced by Senator Dirksen (R-Ill.), July 16, 1969

Title I contains the findings of Congress with regard to the necessity of controlling dangerous substances and the definitions of the principal terms used throughout the Act. The most significant definition is that of "controlled dangerous substance" which includes drugs, immediate precursors, and substances in one of the Act's schedules, but not alcoholic beverages or tobacco. "Immediate precursor" is defined as a substance which is principally or commonly used in the production of a dangerous substance, is an immediate chemical intermediate of such substance, and must be controlled to limit manufacture of such substance.

Title II designates the substances which will be controlled and provides four schedules or classifications in which they will be placed. Schedule I contains substances, such as LSD, heroin and marihuana, which are found to have: a high potential for abuse, no accepted medical use in the United States, and a lack of accepted safety for use under medical supervision. Schedule II contains substances such as opium, methadone, and most of the Class A narcotics, which are found to have: a high potential for abuse, currently accepted medical use in the United States or currently accepted medical use with severe restrictions, and an abuse potential that may lead to severe psychic or physical dependence.

Schedule III contains substances, such as the amphetamines and barbiturates, which have: an abuse potential less than Schedules I and II substances, well documented and approved medical use in the United States, and an abuse potential that may lead to moderate or low physical dependence or high psychological dependence. Schedule IV contains substances which are found to have: a low abuse potential relative to Schedule III substances, currently accepted medical use in the United States, and limited physical dependence and/or psychological dependence liability relative to Schedule III substances. Schedule IV includes substances such as the combination drugs containing small amounts of narcotics or amphetamines.

The Attorney General is authorized to add, delete, or re-schedule any substance as a "controlled dangerous substance." However, he cannot remove any Schedule I substance to Schedules III or IV or from the controls of the Act unless specifically authorized by Congress to do so. When a New Drug Application is submitted to the Department of DHEW for a drug having a stimulant, depressant, or hallucinogenic effect on the central nervous system, DHEW must forward this information to the Bureau of Narcotics and Dangerous Drugs so that its Scientific Advisory Committee can review it before advising the Attorney General whether or not to control the drug. Although no opportunity for a formal hearing is afforded, the Attorney General is required to give notice of the new scheduling and to request the advice of the Secretary of DHEW and the Scientific Advisory Committee established under the Act on whether a substance should be added, deleted, or re-scheduled.

Title III concerns the regulation of the manufacture, distribution, and dispensing of controlled substances. All persons must obtain an annual registration from the Attorney General before engaging in the manufacture, distribution, or dispensing of any controlled substance. The criteria on which the Attorney General is to base his decision whether to grant registration include maintenance of adequate safeguards against diversion, compliance with State and local laws, past experience in the manufacture or distribution of controlled dangerous substances, and other factors the Attorney General deems relevant to the public health and safety.

Practitioners have a right to be registered in order to dispense substances in Schedules II to IV, if they are authorized to dispense them under the law of the State in which they practice. Practitioners wishing to do research with Schedule I substances must get a special registration from the Attorney General, who is required to ask the advice of the Secretary of DHEW on the qualifications of each such practitioner. Before giving such advice the Secretary is to consider the researcher's qualifications, the substances to be used, the place where research will be performed, and the design of the research protocol.

The Attorney General is authorized to deny, revoke, or suspend any registration if the holder is found to have falsified his application, lost his State license, or has been convicted of a felony relating to any controlled dangerous substance. The Attorney General is required to establish general and individual yearly quotas for the production of Schedules I and II substances sufficient to provide for the country's estimated medical, scientific, and industrial needs for lawful export and for maintenance of reserve stocks.

Title VI contains administrative provisions including authority for the Attorney General to carry out "educational or research programs necessary for the effective enforcement of the Act." He may establish methods both to assess the effects of dangerous substances and identify and characterize substances with abuse potential. He may also contract with public or private agencies or with individuals to conduct research or special projects which bear directly on misuse and abuse of dangerous drugs. Authority is given the Attorney General to cooperate with State and local enforcement authorities in exchanging information, cooperating in prosecu-

tion, conducting training programs, maintaining within the Bureau of Narcotics and Dangerous Drugs files on addicts and other drug offenders, and conducting programs to eradicate plants from which controlled substances may be extracted.

The Attorney General is required to appoint a committee of experts to advise him with respect to dangerous substances which may be subject to control under the Act. The experts are to have diversified professional backgrounds and be appointed from a list drawn up by the National Academy of Sciences.

In carrying out his functions under the Act, the Attorney General is authorized to conduct administrative hearings in accordance with the Administrative Procedure Act. He is also empowered, in any matter relating to the control of dangerous substances, to subpoena witnesses, compel their attendance and testimony at hearings and to require the production of any records which he finds relevant to the investigation. Refusal to respond to a subpoena allows the Attorney General to invoke court aid and refusal to obey a court order compelling participation in an administrative hearing is punishable as contempt.

Title VII authorizes service of a search warrant if probable cause has been established to the satisfaction of the judge or magistrate issuing the warrant. An officer may execute a search warrant without announcing his authority or purpose and, in the process, break into the premises to be searched, if the judge or magistrate issuing the warrant is satisfied that there is probable cause to believe that, if notice were given, the property sought would be easily and quickly destroyed or disposed of, or that danger to the officer may result. The issuance of administrative inspection warrants by Federal or State court judges or U.S. magistrates is authorized on a showing of probable cause, which is defined as a valid public interest in the effective enforcement of the Act or its regulations sufficient to justify inspection in the circumstances specified in the application.

The Attorney General is authorized to effect forfeitures of certain property under specified conditions. The property subject to forfeiture includes: controlled dangerous substances produced or obtained in violation of the Act; all raw materials, products and equipment used or intended for use in manufacturing, handling or conveying controlled dangerous substances in violation of the Act; books, records, formulas and other documents or instruments which are used or intended for use in violation of the Act; and all plants from which substances in Schedules I and II may be derived where such plants have unknown owners, are wild or are grown in violation of the Act. The Attorney General may retain the forfeited property, sell it when it is neither harmful nor required to be destroyed by law, require the General Services Administration to remove it in accordance with law or forward it to the BNDD for disposition, which may include delivery for medical or scientific use to any Federal or State agency.

Title VIII repeals essentially all existing laws which regulate dealings in narcotics and dangerous drugs.

S. 2657, introduced by Senator Williams (R-Del.) for himself and Senator Dirksen (R-Ill.), July 18, 1969

The bill would add to the existing registration provisions of the Internal

Revenue Code of 1954 dealing with narcotic drugs and marihuana the prerequisite that any person seeking registration must be legally qualified under the laws of the jurisdiction in which he is operating or proposes to operate to engage in the particular activity for which registration is sought. The bill would amend other sections of the Internal Revenue Code of 1954: to make all transfers of marihuana required to be taxed subject only to a transfer tax of $1 per ounce; to prevent unregistered persons from obtaining order forms; to indicate that the person who engages in marihuana activity must be "lawfully entitled" to do so; and to require the application for registration to show the qualification or entitlement of the applicant to engage in the activities for which registration is sought. Other sections of the bill make it clear that the Internal Revenue Code of 1954 as amended by this bill is intended to reach both persons "in the business" of handling marihuana and illicit traffickers, including those traffickers who obtained the marihuana by harvesting it.

The purpose of the proposed changes and additions is to cure the constitutional defects found in the Marihuana Tax Act by the Supreme Court in its decisions of May 19, 1969 in Leary v. United States and United States v. Covington. It should be noted that the bill is intended merely as a stopgap measure while the more complex and comprehensive "Controlled Dangerous Substances Act of 1969" (S. 2637) is being considered.

For Grants for Local Drug Abuse Education Programs, H.R. 12604, introduced by Rep. Gallagher (D-N.J.), July 7, 1969

The bill provides that for any fiscal year the Commissioner of Education shall allocate among the States the sums appropriated for that fiscal year and that such allocations are to be made on such basis as the Commissioner determines appropriate, except that at least $100,000 is to be allocated to each State.

A grant can be made only to a "qualified organization" which is defined as a nonprofit private organization which: has received the approval of the local educational agency for the area in which it proposes to conduct a program, has at least one professional staff member whose qualifications to assist in the conduct of such programs have been approved by such local educational agency and who is not employed in any other program receiving Federal financial assistance, has at least one licensed physician to advise it in the conduct of its program, and meets such other requirements as the Commissioner may by regulation prescribe.

The "National Drug Testing and Evaluation Act of 1969," S. 2729, introduced by Senator Nelson (D-Wis.), July 30, 1969

The bill would establish a National Drug Testing and Evaluation Center to be operated and maintained as part of the Food and Drug Administration, subject to the supervision and control of the Secretary of DHEW. The Secretary would be responsible for conducting all tests on: new drugs submitted to him for approval, in order to determine whether such new drugs should be approved for commercial distribution, and on drugs which have been approved, to determine whether or not approval of such drugs should be withdrawn.

Senate Joint Resolution 142, introduced by Senator Murphy (R-Calif.), July 28, 1969

The resolution recites the existence of illicit traffic in narcotics and dangerous drugs, notes that the problem is of international consequence and that despite the border efforts of the United States, Mexico, and Canada the flow of drugs continues at a dangerously high rate, and states that this illicit traffic adversely affects the lives of young people who use barbiturates, marihuana, and other dangerous drugs. The resolution "authorizes, requests, and directs" the President of the United States to seek with the President of Mexico and the Prime Minister of Canada the formation of a permanent commission to investigate ways of reducing the traffic in narcotics and dangerous drugs within and between the three countries.

The "State and Local Government Modernization Act of 1969," H.R. 11764, introduced by Rep. Reuss (D-Wis.), May 28, 1969

The bill would empower the President to grant program planning funds to the governors of those States which elect to participate in the State modern governments program, the funds to cover the full cost of preparing for each program. The $50,000,000 authorized for this purpose would be apportioned among the States on the basis of the Bureau of the Census estimate of population; no State would be awarded less than $250,000. Within eighteen months, each State would file a draft "modern government program" with one of four regional coordinating committees established by the bill. These committees would file the drafts with the President and Congress. State modern government programs would set forth plans and timetables for modernizing and revitalizing State and local governments, including such matters as: dealing with interstate regional problems, including those of metropolitan areas overlapping State lines, and of regional cooperation in such areas as health, education, and welfare; strengthening and modernizing State governments; and strengthening and modernizing metropolitan governments by increasing direct State support of such local activities as health, education, and welfare.

To the extent that the bill would increase direct State support of such local activities as health, education, and welfare, the mental health programs might fare appreciably better.

The material in this section is based on summaries prepared by the Legislative Services Branch, Office of Program Planning and Evaluation, NIMH.

Kentucky Mental Health Manpower Commission

The Kentucky Mental Health Manpower Commission was established in 1962 by executive order of the Governor to conduct a research and demonstration program aimed at improving the quality and increasing the quantity of personnel in public and private mental health programs in the State. The Commission is a private, nonprofit organization, but its members are appointed by the Governor.

Financial support comes from many sources: contracts with the National Institute of Mental Health helped to establish and continue the Commission; Federal grants have supported several specific projects; contracts and other agreements with agencies in Kentucky have financed part of the program; and support has also been forthcoming from private corporations, professional associations, and civic groups.

Some of the major projects of the Commission are:

Community Mental Health Worker Project—This study is based on the hypothesis that there are several levels of new workers who can be trained to handle some of the traditional duties of professional staff as well as other services not now provided. It is concentrating on community programs where staffing problems are becoming more acute.

Specifically, three groups of workers are being trained. One will receive four months of intensive training, including courses and practical experience, that will equip them to provide services to patients and families. A second is receiving in-service training as community expeditors or representatives who can promote mental health services in community agencies and organizations. The third is being trained in a two-year college course for work as technicians who can perform various functions in mental health centers. Indigenous and mature persons are being selected for participation, and efforts are made to include centers in rural, urban, and metropolitan areas.

The project, which is funded by a grant from the National Institute of Mental Health beginning in June 1969, calls for detailed evaluation and recommendations based on two years of work experience for the participants.

College Student Work Program in Mental Health—This program, now in its third year, is a systematic coordinated study of services performed by college students working as summer employees and the influence that such employment has on their choice of a career in mental health. In 1969, the program had 30 students out of more than 250 applicants, and for the first time, 12 of them were placed in community mental health centers. The Commission's staff interviews the student during the summer and conducts follow-up surveys. Preliminary results indicate that this work experience has been successful in motivating young people into mental health work.

Career Motivation Study and Recruitment Project—A major endeavor of the Commission during the past five years is a project to test and evaluate methods of interesting high

school students in mental health careers. High school counselors, principals, and faculty are involved in making available to young people information on mental health careers. Another purpose is to learn what can be accomplished by working with community organizations and individuals to stimulate interest in mental health vocations. The project also includes a five-week summer experience program.

Preliminary evaluation shows that school-based and experience-related activities can have an important motivating influence, but that community-based activities, although useful, had a more limited impact or value. It is also estimated that unless efforts are increased to stimulate mental health career opportunities, approximately 50 percent of high school sophomores who show an interest in mental health vocations will have switched to another field by the time they finish college or have been in the labor force for four years.

Teens Who Care—The Kentucky Mental Health-Mental Retardation Teens Who Care Association, established in 1968, is sponsored by the Commission, which provides guidance to local clubs, acts as secretariat, promotes establishment of new clubs, and supplies publicity and other materials. The Association now has more than 1,000 members in 15 clubs. It publishes its own newspaper, *Hope,* three times annually.

Teens who are members volunteer at State hospitals and local psychiatric wards; provide services in comprehensive centers; during the summer they help in camps for handicapped children. A workshop for Teens Who Care members provided training for those who were interested in baby sitting for parents of handicapped children, and those teens who completed the course are certified as being qualified to care for these children. Some clubs sponsor parties for the mentally ill and retarded; others have booths at fairs, radio shows, and presentations before groups of all kinds. It has been stated that Teens Who Care is the "chief hope" for a better relationship between the community and those who are mentally ill or retarded.

Mental Health Work Incentive Project—The Commission has implemented a project, under contract with the U.S. Department of Labor and administered through the Kentucky Department of Economic Security, that provides education, occupational exploration, and on-the-job training to recipients of Aid to Families with Dependent Children. Known as WIN (work incentive), the project is flexible enough to adjust to the needs, attitudes, and capabilities of each trainee. In addition to providing an opportunity for the recipients to become wage-earning members of society, the project benefits mental health programs by providing another source of qualified, trained, and well-motivated manpower.

The Executive Director of the Commission is Earl E. Staton, and the address is P.O. Box 22234, 7320 LaGrange Road, Louisville, Ky. 40222.

Treatment Centers for Narcotic Addicts

Ten more community-based centers for comprehensive care, aftercare, and rehabilitation of narcotic addicts have been established. They are the first to receive Federal grants under a program authorized by Congress in the Alcoholic and Narcotic amendments to the Community Mental Health Centers Act. This brings the number

of such centers funded by the National Institute of Mental Health to sixteen.

The first six programs started in 1968 are in Albuquerque, Chicago, New Haven, New York, Philadelphia, and St. Louis. The new programs are in New York City; Boston; Marlboro, N.J.; Kansas City, Mo.; Baltimore; Hartford, Conn.; San Antonio; Eagleville, Pa.; and San Juan, P.R.

Methadone maintenance will be used in several of the programs as an experimental technique under NIMH guidelines and will undergo intensive study in the New York program. Use of former addicts to bring in persons needing treatment will be part of all programs. The Baltimore program will stress ambulatory treatment, with minimum disruption of home life and employment and is restricting inpatient services to two hospital beds. Storefront facilities and active outreaching programs will be used in Eagleville and Kansas City. In Puerto Rico, where there is an adverse environment in depressed areas of San Juan, the addicts will be housed in camps in rural areas where they will receive psychotherapy and intensive vocational training.

Study of Child Care Patterns

The Committee on Social Problems of the American Psychoanalytic Association has organized a project on Normal Early Child Development, with emphasis on child care in deprived subcultures and its relation to ego development in children from birth to age 3.

The project is organized around several task forces: child-rearing practices, as related to mother and stranger-caretakers; how children are taught to speak, as related to the role of speech in ego development; practices contributing to the sense of self and ego identity; behavior regulation and organization as functions in ego development; aggression and its relation to learning; incidence and impact of separation anxiety.

The task force will survey the psychoanalytic literature as well as other material on child development; they will also obtain information from psychoanalysts who have had experience in working with deprived children.

A publication, planned for late 1970, will be prepared for an audience of professionals and will have as a primary purpose the encouragement of analysts to work as teachers and consultants with persons who have direct care of children.

Dr. Robert Dorn is chairman of the Committee on Social Problems and Dr. Eleanor Pavenstedt heads the project.

Mental Health News from Alaska

Alaska recently became the fiftieth State to receive Federal funds for establishment of a community mental health center. The Gateway Mental Health Center will be opened in Ketchikan to provide a full range of mental health services for the mountain-rimmed Ketchikan Gateway Borough. The center's area of service, which has a population of 18,800, includes fishing villages, logging camps, and islands. Up to now, only the acutely ill in the region could receive any kind of psychiatric treatment and then only by being transported 1,000 miles away to Anchorage.

Planting of a long row of crab apple trees along the entry way to the Alaska Psychiatric Institute was the beginning of a beautification project

for the hospital grounds. New lawn furniture for patients was donated by the NCO Wives Club of Elmendorf Air Force Base. The $6.5 million structure, completed in 1962, is situated in an area of natural scenic beauty with the Chugach Mountains to the east, Mt. McKinley and Mt. Foraker to the north, and the Alaska Range to the west. It is located on an 80-acre tract about one-fourth of which is covered with native birch, spruce, and alder trees.

Mental Health Developments in New Jersey

The Mount Carmel Guild Multi-Service Center, the first center in New Jersey with Federal grants for both construction and staffing, opened in September. It is designed to serve more than 155,000 low-income residents of Newark, and will be the first operating center in Essex County and the City of Newark. The Mount Carmel Guild is the sponsoring agency for construction and staffing grants; St. James and St. Michael Hospitals are affiliates. The Center will provide inpatient, outpatient, partial hospitalization, emergency care, education and consultation, diagnosis, research and evaluation, pre-operative and post-operative care and rehabilitation.

Six counties—Bergen, Burlington, Middlesex, Monmouth, Passaic, and Sussex—have appointed county mental health administrators under the Community Mental Health Services Act. The administrators, whose appointments were made by the counties' mental health boards and approved by the county Freeholders, will work with the county boards in the development of comprehensive community mental health centers, act as secretariats to the boards, and serve as their representatives in county planning activities and as liaison between county and State mental health programs.

A new Inter-Faith Chapel was dedicated at Ancora State Hospital. The chapel was renovated by hospital employees with funds provided by the Ancora Volunteer Services; no public funds were involved.

Acting Director of the New Jersey Division of Mental Health is Dr. Michael R. Simon, Medical Director and Chief Executive Officer of Marlboro State Hospital.

Mental Health News from New York

In New York, 61 of its 62 counties now have local community mental health boards to work cooperatively with the State Department of Mental Hygiene in developing a network of services for the mentally disabled. Only Hamilton County, with a small population of 4,300, has no board. There is a single mental health board for New York City's five counties. The goal is to coordinate State, local, and voluntary agencies into a single system so that the mentally handicapped will receive comprehensive service in their own communities. State hospitals are being reorganized to serve specific geographic areas. New York now has 12 community mental health centers in operation, with three more—Rockland County Mental Health Center, Mercy Hospital Center in Jefferson County, and Samaritan Hospital Center in Rensselaer County—scheduled to open by late 1969, and 14 additional centers in the planning stages.

A halfway house and an Independent Living Center have been opened at Willard State Hospital. The halfway house provides a transitional

living situation for male patients no longer requiring hospitalization but not yet ready to cope with the demands of daily life. The apartment-style halfway house permits patients to live in the house while working in the community during the day. The Independent Living Center has patients living together in one of the buildings with a minimum of supervision by staff. They are responsible for maintenance of the Center, and have set up their own government and elected officers. Living in the Center should help its residents to assume responsibility and, it is hoped, better prepare them for return to independent living in the community.

Also at Willard State Hospital, a new shop operated by the patients has been opened. It was started to serve patients with limited funds, who select merchandise free of charge from donated items. Patient customers are given five "chips" when they come into the shop to "buy" merchandise; a sales slip is written up by the clerk to keep a record of merchandise selected. The shop should have a therapeutic value to both patient-clerks and customers. The clerks learn a job in a realistic setting. And the customers are able to obtain articles that they ordinarily could not afford. "Going shopping" also is an incentive for the patient to leave the ward and to take responsibility for transportation to the shop.

At Bronx State Hospital a crisis intervention team is now in operation. Its goal is to prevent hospitalization of persons with severe mental disturbance who formerly would have been hospitalized. Patients are seen first in the psychiatric emergency room and are then referred to the team by the psychiatrist on duty there. To be referred the patient must be a resident of the Jacobi catchment area with a major problem (except for addiction or alcoholism) and who would ordinarily be admitted to the hospital. After the interview by the emergency room psychiatrist and receiving necessary medication, the patient is sent home (unless there is a risk of homicide or suicide) and told that the crisis team will visit him within 24 hours. The team checks on referrals every morning and immediately arranges a home visit. The patients receive short-term, very intensive supportive treatment, with considerable flexibility in approach. Community agencies are used when appropriate and the patient's family is involved whenever possible. Preliminary results show that of the 25 patients referred to the team, only one later had to be admitted to the hospital. Crisis intervention is still a relatively new procedure, and it may take some time to work out a full satisfactory model.

Highlights of the American Psychological Association Convention

The American Psychological Association held its 77th Annual Convention in Washington, D.C. on August 31–September 4, 1969, with a convention theme "Psychology and the Problems of Society."

Among the paper-reading sessions, symposia, and addresses were such topics as student unrest, urban and ghetto problems, black and white relations, computers and privacy, student drug use, violence, delivery of mental health care, arms control, and social indicators. There were special symposia on "Early Learning and Compensatory Education," "Factors Underlying Student Unrest on the College Campus," "Innovative Ap-

proaches to Urban Problems," "The Scientist in a Rapidly Evolving Society," and "Psychologists and Federal Legislation."

The three $1,000 awards for Distinguished Scientific Contributions were made to Jean Piaget, Stanley J. Schacter, and Herbert Simon. Dr. Piaget, a Swiss psychologist and the first European to receive the award, was honored for his "revolutionary perspective on the nature of human knowledge and biological intelligence." Dr. Schacter, professor of social psychology at Columbia University, was cited "for consistent, coherent, and creative work that materially advanced our understanding of behavior in social contexts." Dr. Simon, professor of psychology and computer science at Carnegie-Mellon University, received the award for "his leadership in the development of new theories of thinking and of its relation to perception, attention, memory, and language."

The Richardson Creativity Award went to Dr. Frank Barron of Colwell College of the University of California at Santa Cruz for his "insightful studies of the creative process and for his conceptualization of several significant variables of personality, his development and standardization of tests to measure these dimensions of personality and his researches which have demonstrated their role in the creative person."

The American Psychological Foundation Gold Medal Award went to Dr. Henry A. Murray, professor emeritus at Harvard University in recognition of his distinguished and long-continued record of scientific and scholarly accomplishments. The Foundation also announced its $1,000 National Media Awards. One went to Dave Smith of the *Los Angeles Times* for his story "Dark Valley of a Boy's Mind." Another went to John Sharnik and Harry Morgan of CBS-TV News for "LSD: The Spring Grove Experiment" and "The Farthest Frontier." *Time* magazine received special recognition for developing its new section on "Behavior."

The Presidential Address was given by Dr. George A. Miller of Rockefeller University on "Psychology as a Means of Promoting Welfare." The stated purpose of the Association is "to advance psychology as a science and as a means of promoting human welfare. . . ." Dr. Miller stated that the greatest contribution psychologists can make to bring about social change is to put psychological knowledge and tools at the disposal of the public at large. He noted that there has been a running debate between psychologists as to whether they and the American Psychological Association should take an active part in influencing public policy. But, he said, the real challenge is not how to change policy but how to foster a social climate in which a new public conception of man based on psychology can develop, and that methods must be devised to deliver psychological knowledge to the public in a form tailored to the perceived needs of the people. "I can imagine nothing," he concluded, "that would be more relevant to human welfare and nothing that would pose a greater challenge to the next generation of psychologists, than to discover how best to give psychology away."

American Association of Community Clinic and Center Psychiatrists

The American Association of Community Clinic and Center Psychiatrists is organized "to provide a representa-

tive body of clinic and center psychiatrists to define and protect the role of medical and psychiatric leadership and responsibility in community health services in the United States and Canada."

Its origin can be traced back to 1962 when a survey was made of some 800 clinics to learn if there was interest in forming an organization of psychiatric outpatient clinics. The response was enthusiastic, and after several meetings and discussions, two organizations emerged. One is the "Psychiatric Outpatient Centers of America" (POCA), which is essentially an organization of clinics and centers themselves (although individual non-voting membership is included).

The other began as the Committee for Organizing Outpatient Clinic Psychiatrists and in 1965 became the Association of Community Clinic Psychiatrists. The name has now been expanded to the American Association of Community Clinic and Center Psychiatrists.

The Association now has about 200 members all of whom are members of the American Psychiatric Association in accordance with one of the initial criteria for membership. A new Constitution and By-Laws provides that any physician who is a member of the American Psychiatric Association, the American College of Psychiatry, or who is a Diplomate (or eligible) of the American Board of Psychiatry and Neurology and ". . . who is actively employed either part or full time in a psychiatric clinic or guidance or mental health center" may become a regular member.

In addition to local meetings and round tables, the Association meets annually in conjunction with the American Psychiatric Association. At the 1970 meeting, the Association will be sponsoring a meeting on "Mental Health Administration in Patient Care."

Officers of the Association are Dr. William McKnight, president; Dr. Arnold Kallen, first vice-president; Dr. Albert Sullivan, second vice-president; Dr. Harvey Bluestone, secretary; Dr. Neil B. Kimerer, treasurer. Dr. Nancy A. Durant is editor of the *Newsletter*.

Sigmund Freud Archives

The Sigmund Freud Archives, Inc. was founded in 1951 by a group of psychoanalysts and chartered as a nonprofit corporation in New York. The Library of Congress was selected as the depository for the documents and is the official custodian of the Archives.

Since its founding, the Archives has collected a great deal of Freudiana. This includes letters written by and to Freud and his family, original manuscripts, documents, and photographs. Literary estates of eminent colleagues or students of Freud are included. For example, the literary estates of Drs. A. A. Brill, Maxwell Gitelson, and David Rapaport are in the Archives. Dr. Brill's papers are of special interest because they include a history of the psychoanalytic movement in the United States.

Many items are donated to the Archives. An example is 29 case histories written by Freud while he was working at Meynert's Psychiatric Clinic in Vienna. Another is his "Accounting Book" for 1897–99 in which he entered his professional fees. A third is the original manuscript of *Trauer und Melancholie*.

Another feature of the Archives is

interviews with persons who had known Freud or his family. A former patient, a subject of a well-known case history, is interviewed periodically.

Some of the materials are kept confidential by the Library of Congress for as long a period as designated by the donor or the Archives.

The Sigmund Freud Archives is entirely dependent on contributions. It receives some support from the American Psychoanalytic Association and its affiliates, but acquisition of expensive items depends on the generosity of donors.

Officers of the corporation are Dr. Bertram D. Lewin, president; Dr. K. R. Eissler, secretary; and Dr. Ruth S. Eissler, treasurer.

Child Psychiatry and Human Development —A New Journal

In spite of the proliferation of journals during the last few years, the field of child psychiatry still has relatively few publications. Accordingly, a new journal—*Child Psychiatry and Human Development*—will be published quarterly with plans for the first issue to be available in July 1970. It is edited by John C. Duffy, M.D., Acting Director of the Division of Child Psychiatry, University of Minnesota Medical School. The Editorial Board is made up of representatives from child psychiatry, pediatrics, psychology, social sciences, and human development.

Manuscripts may be addressed to the Editor: Dr. John C. Duffy, 412 Union St., S.E., Box 95, Mayo Memorial Building, Minneapolis, Minn. 55455. Subscription information may be obtained from Behavioral Publications, Inc., 2852 Broadway-Morningside Heights, New York, N.Y. 10025.

Teaching Psychiatric Nursing

An Approach to the Teaching of Psychiatric Nursing in Diploma and Associate Degree Programs is a new publication of the National League for Nursing. It is the final report of a project, supported in part by the National Institute of Mental Health, concerned with the need to integrate psychiatric nursing into the basic curriculum. The report describes how this was done in eight diploma and eight associate degree programs that participated in the project, and concludes with an evaluation and recommendations. It was prepared by Joan E. Walsh and Cecilia Monat Taylor and is available for $2.50 (send check or money order) from the NLN, 10 Columbus Circle, New York, N.Y. 10019.

Pierre the Pelican—Revised

The Pierre the Pelican Series, published by the Louisiana Association for Mental Health, has long been a classic in the field of mental health education. The Prenatal series has now been revised; its nine pamphlets are intended for monthly distribution from the time that a woman suspects she is going to become a mother—and finds out that she is—until the last of the series arrives just after her return home from the hospital. Information about the revised pamphlets and suggestions on effective use may be obtained from the Louisiana Association for Mental Health, 1528 Jackson Ave., New Orleans, Louisiana 70130.

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recent nimh publications

Single copies of these publications may be obtained from the Office of Communications, National Institute of Mental Health, LL02, 5454 Wisconsin Avenue, Chevy Chase, Maryland 20015. A complete list of all publications available from the NIMH may also be obtained from the Office of Communications. If a price is given, the publication may be ordered in quantity from the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402. Enclose a check or money order payable to the Superintendent of Documents.

Mental Health Considerations in Public Health. This 252-page book is made up of twelve papers prepared for the National Conference on Mental Health in Public Health held on May 27-30, 1968. It concentrates on the relation of mental health knowledge to the practice of the profession of public health. Edited by Stephen E. Goldston. Public Health Service Publication No. 1898. $1.25.

Bibliography on Suicide and Suicide Prevention. This is a two-part bibliography, one part covering the literature from 1897 through 1957, and the second part the literature from 1958 through 1967. The first part cites 2202 references and the second part 1267 references. Subject and author indexes are included. Compiled by Norman L. Farberow, Ph.D. Public Health Service Publication No. 1979. $1.75.

Sociologists and Anthropologists. Supply and Demand in Educational Institutions and Other Settings. The results of a study to assess the supply of and demand for manpower in sociology and anthropology are reported in this 164-page publication. Prepared by the Manpower and Analytic Studies Branch, Division of Manpower and Training Programs, NIMH. Public Health Service Publication No. 1884. $1.50.

Students and Drug Abuse. This 16-page article is reprinted from *Today's Education*. Prepared by the Office of Communications and Center for Studies of Narcotic and Drug Addiction, NIMH.

Selected Sources of Inexpensive Mental Health Materials. A directory for mental health educators, this 74-page pamphlet contains an annotated list of publishers of educational materials in mental health. Only publishers of mental health materials designed for use by the lay public and groups involved in education work with the lay public are included. Prepared by the Mental Health Materials Center under contract with the National Clearinghouse for Mental Health Information. Public Health Service Publication No. 1911. 40¢.

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